AMF® REECE

Better Ideas, Better Made

MODEL AUTOJIG

84-72M

PARTS AND SERVICE MANUAL

AMF® REECE

Better Ideas, Better Made

LIMITED WARRANTY ON NEW AMF REECE EQUIPMENT

Warranty provisions:

A ninety (90) day limited service labor warranty to correct defects in installation, workmanship, or material without charge for labor. This portion of the warranty applies to machines sold as ”installed” only.

A one (1) year limited material warranty on major component parts to replace materials with defects. Any new part believed defective must be returned freight prepaid to AMF Reece, Inc. for inspection. If, upon inspection, the part or material is determined to be defective, AMF Reece, Inc. will replace it without charge to the customer for parts or material.

Service labor warranty period shall begin on the completed installation date. Material warranty shall begin on the date the equipment is shipped from AMF Reece, Inc.

Exclusions:

Excluded from both service labor warranty and material warranty are: (1) Consumable parts which would be normally considered replaceable in day-to-day operations. These include parts such as needles, knives, loopers and spreaders. (2) Normal adjustment and routine maintenance. This is the sole responsibility of the customer. (3) Cleaning and lubrication of equipment. (4) Parts found to be altered, broken or damaged due to neglect or improper installation or application. (5) Damage caused by the use of non-Genuine AMF Reece parts. (6) Shipping or delivery charges.

There is no service labor warranty for machines sold as ”uninstalled”.

Equipment installed without the assistance of a certified technician (either an AMF Reece Employee, a Certified Contractor, or that of an Authorized Distributor) will have the limited material warranty only. Only the defective material will be covered. Any charges associated with the use of an AMF Reece Technician or that of a Distributor to replace the defective part will be the customer’s responsibility.

NO OTHER WARRANTY, EXPRESS OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, and FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER IS GIVEN BY SELLER OR SELLER’S AGENT IN CONNECTION HEREWITH. UNDER NO CIRCUMSTANCES SHALL SELLER OR SELLER’S AGENT BE LIABLE FOR LOSS OF PROFITS OR ANY OTHER DIRECT OR INDIRECT COSTS, EXPENSES, LOSSES OR DAMAGES ARISING OUT OF DEFECTS IN OR FAILURE OF THE EQUIPMENT OR ANY PART THEREOF.

WHAT TO DO IF THERE IS A QUESTION REGARDING WARRANTY

If a machine is purchased through an authorized AMF Reece, Inc. distributor, warranty questions should be first directed to that distributor. However, the satisfaction and goodwill of our customers are of primary concern to AMF Reece, Inc. In the event that a warranty matter is not handled to your satisfaction, please contact the appropriate AMF Reece office:

East Europe
Prostejov, Czech Republic
Phone: (+420) 582-309-275
Fax: (+420) 582-360-608
e-mail: amfreece@amfreece.cz

Southwest Asia
Istanbul, Turkey
Phone: (+90) 212-465-0707
Fax: (+90) 212-465-0711
e-mail: amfreeceturkey@superonline.com

West Europe/Africa
Leeds, United Kingdom
Phone: (+44) 113-275-9131
Fax: (+44) 113-275-4116
e-mail: amfreece@amfreece.co.uk

Southeast Asia
Kowloon, Hong Kong
Phone: (+852) 2787-2273
Fax: (+852) 2787-5642
e-mail: amfreece@netvigator.com

AMF® REECE
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Warranty Registration Card

(Please Fax or Mail immediately after installation)

Note: All Warranty Claims Void, unless Registration Card on file at AMF Reece HQ

Machine model number:
(S101, S100, S104, S211, Decostitch, S4000 BH, etc)

Manufacturer‘s serial or production number:

Installation Site Information:

Customer‘s Name:

Customer‘s Mailing Address:

Customer‘s Telephone Number:

Supervising Mechanic‘s or Technician‘s Name:

Signature of Supervising Technician:

AMF Reece Technician‘s Name:

AMF Reece Technician‘s Signature:

Type of garment produced at this location?

Average Daily Production Expected from this machine?
(number of buttonholes, jackets sewn, pants produced, buttons sewn, etc)

Any special requirements required at this location?

What other AMF Reece Machines are at this location?

How can we serve you better?

Tovární 582, 796 25 Prostějov, Czech Republic
Fax: +420 582 360 606, e-mail: service@amfreece.cz, website: www.amfreece.com

A.M.F Reece Autojig Machine AJ 84-72M

Service Manual

for

Serial No. 0001 Onwards

Contents

SAFETY INSTRUCTIONS

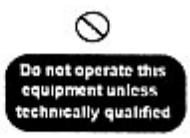
- The machine must only be used for the purpose it was designed for. In case of conversion into another version all valid safety instructions have to be considered.

- Do not operate this machine without the safety devices it is equipped with.


DANGER


All guards must be in position before starting

- The machine must only be switched on and operated by persons who have been instructed accordingly.



- When exchanging parts and when doing maintenance work the machine must be disconnected either by actuating the master switch or by removing the mains plug.

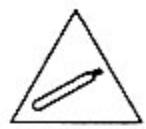

CAUTION
Risk of electric shock

- When threading machine Emergency Stop must be engaged or the machine switched off.

CONTINUED.....

SAFETY INSTRUCTIONS CONTINUED

- When carrying out maintenance or repair work on pneumatic devices the machine must be disconnected from the pneumatic supply source.



CAUTION
Compressed air

- Work on electrical equipment on this machine must only be carried out by electricians or other persons who have instructed accordingly.

- The actual 'A' weighted sound pressure level taken on an identical machine is 75.5 DB (A)
- Take appropriate measures for protection of hearing if sound pressure of 85 DB (A) is exceeded.

- Ensure lifting rail is used when lifting with fork lift truck.

IMPORTANT NOTES

To avoid trouble or damage it is absolutely necessary to observe the following instructions.

- Before you put the machine into operation for the first time clean it thoroughly, remove all dust which has accumulated on it.
- Oil all necessary parts ensuring drive wheel section is free from any type of lubricant.
- Check to make sure line voltage agrees with the voltage indicated on the motor rating plate. If it does not, be sure **not to** plug in the machine.
- The balance wheel should always rotate towards you (when standing at the front of the machine). If it does not, alter the direction of the motor. Refer to Efka manual section, motor direction setup.
- Check you have the correct pneumatic line pressure.
- Always make sure the correct program is selected on the AMF Reece controller related to the type of jig being used.

QUICK REFERENCE SPECIFICATION SHEET

ELECTRICAL REQ:	220v @60Hz, single phase, 600W 240v @50Hz, single phase, 600W
AIR SUPPLY:	Pressure - 80 p.si (5.5 Bar) Consumption - 0.40 c.f.m (12 l/Min)
NOISE LEVEL:	75.5 DB (A)
SEWING HEAD:	Sunstar KM-506-7S Lockstitch with underbed trimmer
SEWING HEAD MOTOR:	Efka Vario DC - PF60AB2 controller
SEWING HEAD SPEED:	2600 SPM (at max)
STITCH SIZE:	0.5mm - 3.5mm (max varies with material)
LUBRICATION SYSTEM:	Sunstar Head - Sump Reservoir, Wick and Pump Distribution System.Jig Track - Silicon Spray
NEEDLE TYPE:	135 K
RECOMMENDED THREAD:	Core spun polyester/cotton.
SEWING AREA:	175 x 175mm
TABLE HEIGHT:	930mm (36.5")
OPERATOR POSITION:	Standing

AMF REECE
Better Ideas, Better Made

AMF Reece Autojig, Models:

AJ84-72M

Manual Version
January 2002
Serial Number 113 Onwards

2.1 Loading of Material into the Jig (e.g. Collar)

a) Open jig and position lower ply of cloth to the jig location marks.

b) If the jig has a fulling bar (i.e. middle section) close this on to the lower ply of cloth.

c) Position the upper ply of cloth to jig location marks.

d) Close the top plate of the jig.

e) Jig now ready to insert into machine.

2.2 Loading jig to the machine

a) Slide the loaded jig with the right hand on the top plate, towards the needle, lining up the start position approximately 1/2" (13mm) behind the needle.

NOTE:
When the jig is loaded, do not lift up from the table.

b) Push the jig to the right and over the raised flap in front of the needle plate.

c) As the jig is pushed to the right, the jig flap will drop to its normal position.

d) If the jig is located correctly, the raised 'D' shape of the needle plate will locate in the track of the jig.

e) Pull jig back to closed track. (Double jig should be pulled back so jig contacts presser foot).

f) When the jig is loaded correctly to the machine, press the green start button located on the table top; and the automatic cycle will begin.

g) At the end of the cycle the jig will be ejected (or, in the case of a double jig, wait to be pulled forward to its start position).

NOTE:
The machine has an A.M.F. Reece controller that is programmed to perform different functions, depending on the type of jig being used.

2.3 Program Selection

The different programs are achieved by selecting programs 1 – 6 on the A.M.F. Reece controller.

a) **Collar Jig**
requiring needle down both corners

– select program 3

b) **Double Pocket Flap**
– select program 2

c) **Single Pocket Flap**
– select program 1

d) **Single Breasted Jacket**

– select program 5

e) **Double Breasted Jacket**

– select program 6

f) **Collar – Slow Sew Round Collar**
– select program 4

3.1 To start up the Machine

a) Turn the green switch on the right hand front panel of the machine, to switch on the air supply to the machine.

b) Press black button on starter box.

NOTE:
The presser foot of the machine is always in the raised position when the machine is in the 'Stop' mode with the air and power switched on.

Carry out the following steps of procedure after the power switch has been turned OFF.

3.2 Installation of Needle

Insert the needle to the needle bar to the full with its longer groove to the left, and firmly fasten by using the needle clamp screw (Figure 3.1).

Applicable needle: 134

NOTE:
Needle size and needle point are dependent on the type of material being used. (Refer to needle and thread section 3.13).

a) Using a screwdriver, loosen the needle set screw on the left hand side of the needle bar.

b) Insert the needle and push it up as far as it will go (make sure the long groove faces towards the left).

c) Tighten needle set screw securely.

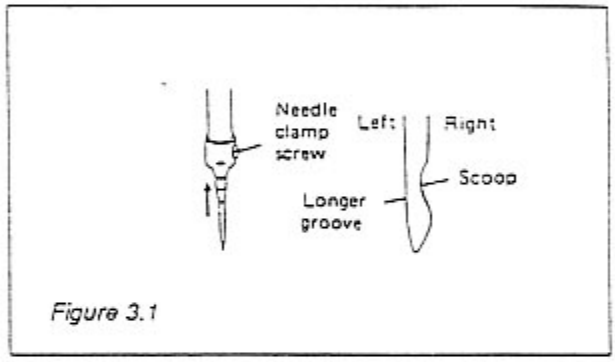


Figure 3.1

3.3 Threading of Upper Thread

Turn the handwheel toward you to make the thread take-up reach the highest position, and run a thread from the spool pin to the needle through each part in such an order as numbered in Figure 3.2. At the needle, run the thread from left to right and leave the thread end for approx. 5 cm.

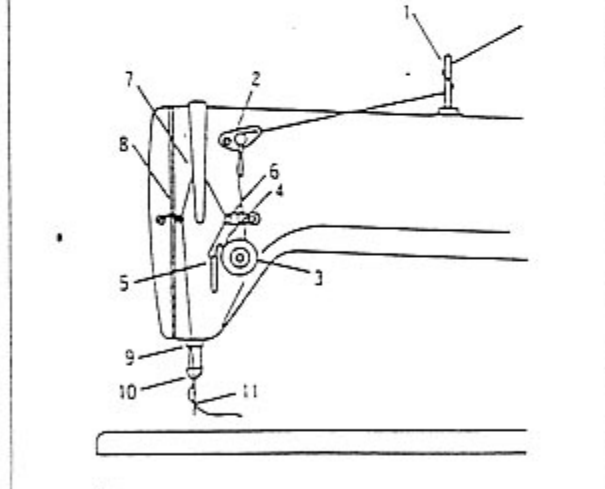


Figure 3.2

3.4 Bobbin winding

a) Set the bobbin with the bobbin winder spindle, and wind the thread on the bobbin for a few turns by hand.

b) Push fully the bobbin winder setting lever to make the winder pulley contact with the V-belt.

c) Set winding capacity at 80% using the bobbin winding capacity regulating screw.

d) If bobbin winding is uneven, adjust the position of the bobbin winder complete so that winding becomes even.

e) When winding finishes, the bobbin winder setting lever flips up and the bobbin winding pulley stops.

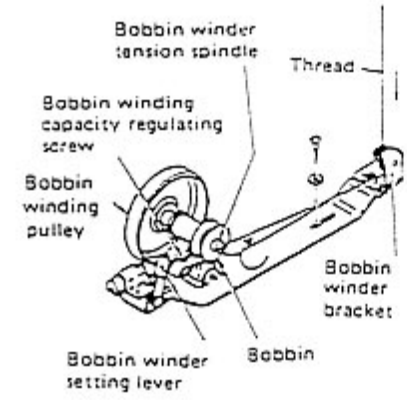


Figure 3.3

3.5 Bobbin setting into Bobbin Case

a) Set the bobbin in the bobbin case in such a way that the bobbin will rotate in the direction as shown by arrow in Figure 3.4 when thread is pulled out.

b) Run a thread through the thread guide of the bobbin case and draw the thread, and the thread will come out from the thread feeder through the tension spring.

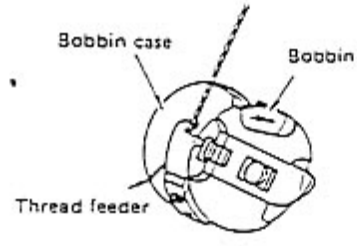


Figure 3.4

MACHINE ADJUSTMENTS

3.6 Upper Thread Tension (Figure 3.5)

Use the tension regulating thumb nut. Clockwise turns increase tension, and counterclockwise turns decrease tension.

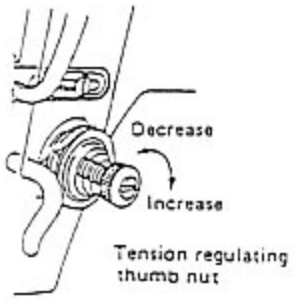


Figure 3.5

3.7 Lower Thread Tension (Figure 3.6)

Turn the tension screw clockwise to increase, and counterclockwise to decrease.

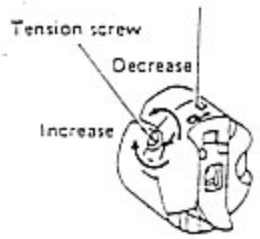


Figure 3.6

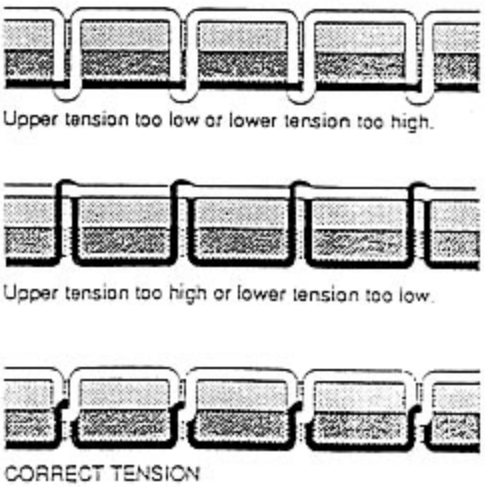


Figure 3.7

3.8 Adjustment of Stitch Length

To adjust the stitch length, turn the feed regulating dial (Figure 3.8).

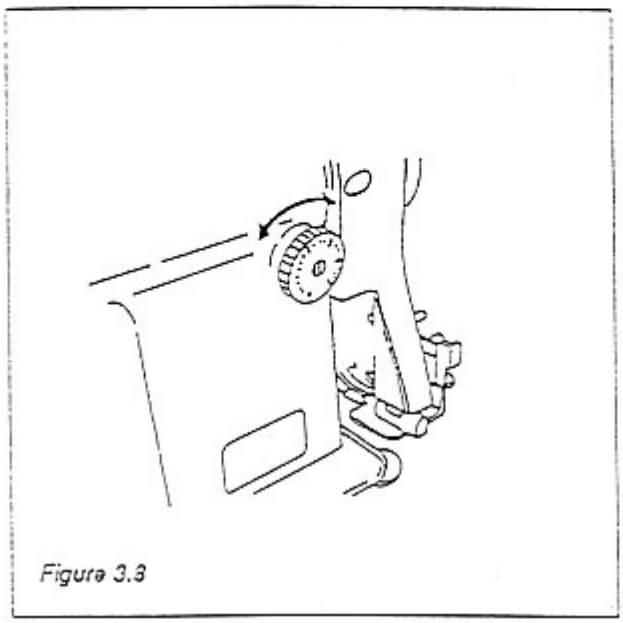
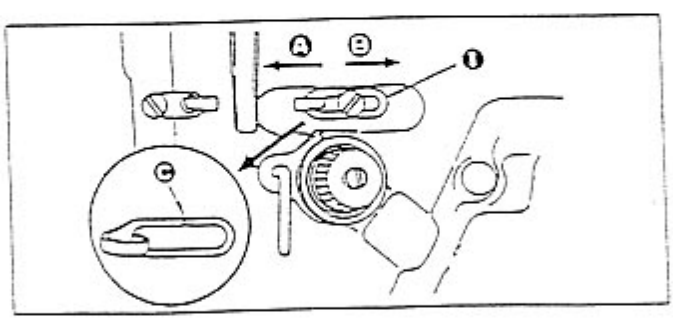


Figure 3.8

3.9 Adjusting The Thread Take-up Stroke

Carry out the following steps of procedure after the power switch has been turned OFF.

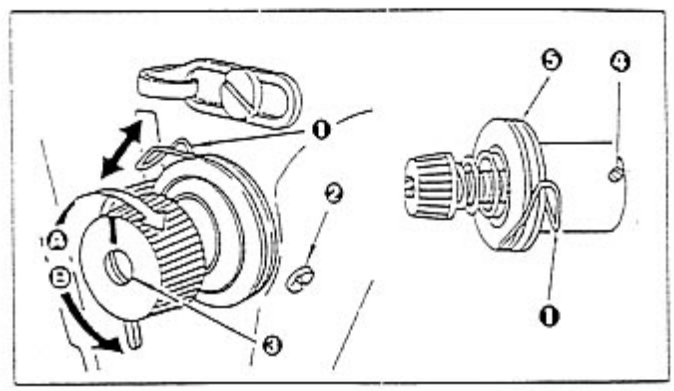
1) When sewing heavy-weight materials, move thread guide ❶ to the left (in direction Ⓐ) to increase the length of thread pulled out by the thread take-up.
2) When sewing light-weight materials, move thread guide ❶ to the right (in direction Ⓑ) to decrease the length of thread pulled out by the thread take-up.
3) Normally, thread guide ❶ is positioned in a way that marker line Ⓒ is aligned with the center of the screw.



3.10 Thread Take-up Spring

1. Changing the stroke of thread take-up spring ❶
1) Loosen setscrew ❷ .
2) As you turn tension post ❸ clockwise (in direction Ⓐ), the stroke of the thread take-up spring will be increased.
3) As you turn the knob counterclockwise (in direction Ⓑ), the stroke will be decreased.

2. Changing the pressure of thread take-up spring ❶
1) Loosen setscrew ❷ , and remove thread tension (asm.) ❺ .
2) Loosen setscrew ❹ .
3) As you turn tension post ❸ clockwise (in direction Ⓐ), the pressure will be increased.
4) As you turn the post counterclockwise (in direction Ⓑ), the pressure will be decreased.



Cleaning

Clean the hook and base area once every day, removing any lint or thread which may have accumulated. For this purpose, the jig plate can be removed from the machine. Switch off the machine, unscrew the needle plate and remove the lint with a soft brush.

Remove the jig drive guard and clean away any dust or lint which may have accumulated.

NOTE:
Never oil the jig drive wheel.

3.11 Regulating Foot Pressure on Jig

Adjustment of Presser Pressure

Turn the presser regulating screw clockwise to increase, and counterclockwise to decrease. Be sure to tighten the nut after adjustment. A foot pressure of approximately 1-5 to 2 kg will give best results on all materials.

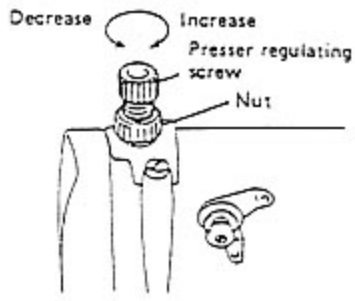


Figure 3.10

3.12 Emergency Stop

This is achieved by pressing the red Stop button. This will activate Emergency Stop sequence. Machine will not restart until Stop button is reset.

3.13 Needle and Thread

Selection of the proper needle depends on the material and thread used.

For selection of the proper needle and thread sizes refer to the table below:

		THREAD SIZE				
	NEEDLE SIZE (NM)**	COTTON	SILK	SYNTHETIC	LINEN	NEEDLE SYSTEM
A	60	100 - 80	140	200 - 150		134k
	70	70 - 60	120	180 - 120		
B	80	60 - 50	100	120 -100		134k
	90	50 - 40	80	100 - 80	70	
	100	40 - 30	70	80 - 60	60	
C	110	30 - 24	60	60 - 50	50	134k
	120	20	50	50 - 40	40	
	130	12	40	40 - 30	35	
	140	10	30	30 - 20	30	

A = LIGHT WEIGHT MATERIALS

B = MEDIUM WEIGHT MATERIALS

C = HEAVY WEIGHT MATERIALS

NM** = NEEDLE SIZE IN HUNDRETHS OF MM

4.1 Jig Feed Mechanism

a) Feed Motion Timing

Time the feed motion to be completed when the descending needle is approximately 6mm above the material.

Alterations to the stitch length are made in the usual manner using the stitch regulator.

b) Drive Wheel Assembly (Figure 4.1)

To replace a worn drive wheel detach the drive arm (10) from the machine bed, unfasten the spherical rod end bearings (14) from the arm and the drive wheel housing. Next remove the bearing (22), free-wheel housing (20) and drive wheel (18) complete from the arm. Using the two M5 holes in the drive wheel with two screws as an anchor, loosen nut (25) and remove drive wheel from bearing. When re-assembling care should be taken that all surfaces are clean and free from lint etc. The pivot spindle (17) should at this stage be lubricated with graphited grease before replacement into the drive wheel.

CAUTION:
ORDINARY GREASE OR LUBRICATING OIL IS NOT SATISFACTORY IN THE DRIVE WHEEL STUD HOUSING. USE A GREASE CONTAINING GRAPHITE OR MOLYBDENUM DISULPHIDE.

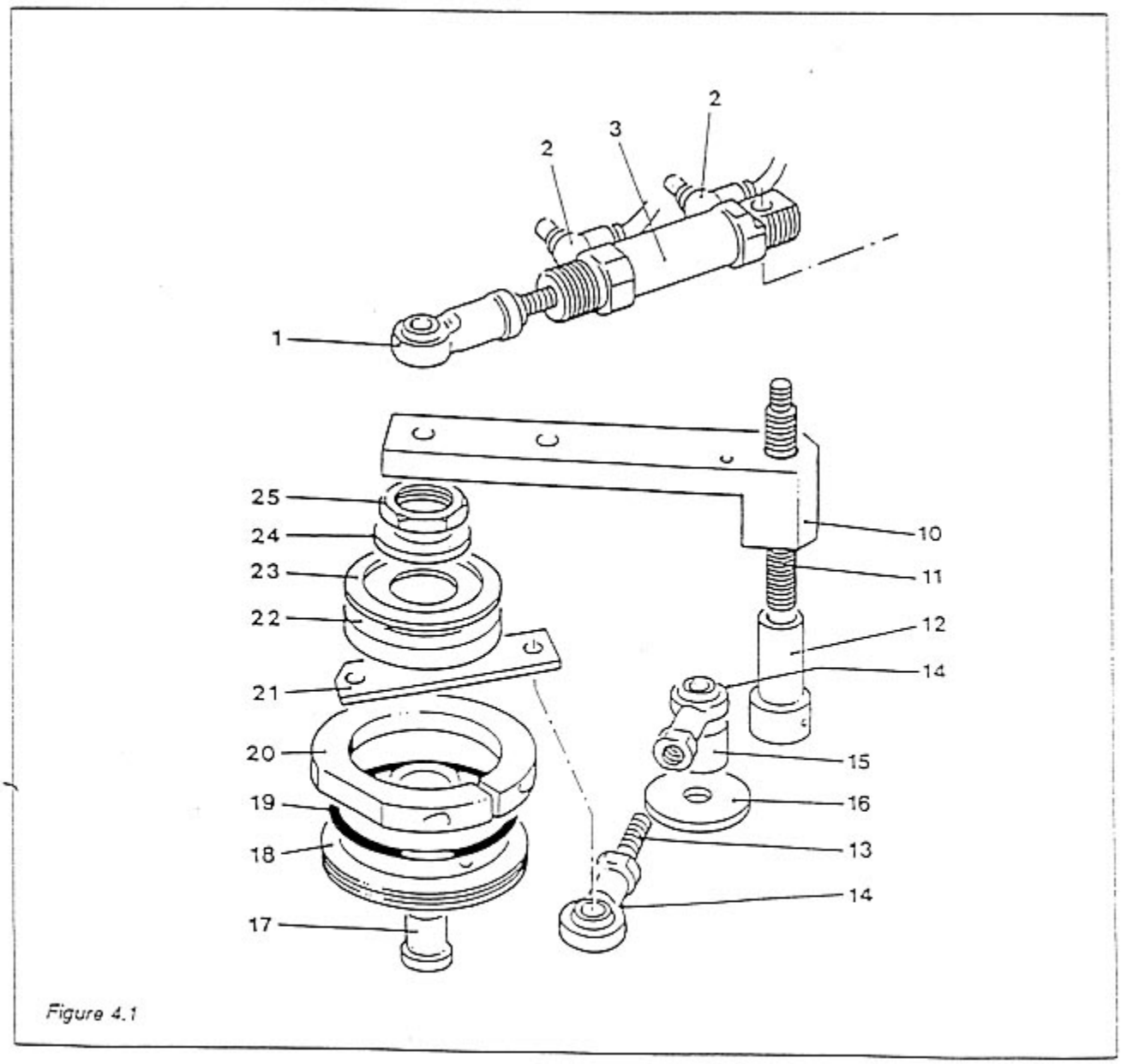


Figure 4.1

The clutch is lubricated with oil and has an 'O'-ring on the bottom to prevent oil leakage. It is also covered with a 'Nilos' sealing ring to exclude dust and fibrous waste. The clutch should be lubricated lightly every 100 running hours with light machine oil (non-staining).

Ensure drive wheel does not foul on base of machine, when unit is tightened down.

c) *Drive Wheel Cylinder (Figure 4.1)*

The rod end bearing (1) should be set so that when the cylinder is fully extended the drive wheel is taken 3mm past its contact position.

CAUTION:
CHECK THIS SETTING BECAUSE, IF THE DRIVE WHEEL TRAVELS TOO FAR, IT WILL CONTACT AND DAMAGE THE PHOTOCELL IF THE MACHINE IS RUN WITHOUT A JIG.

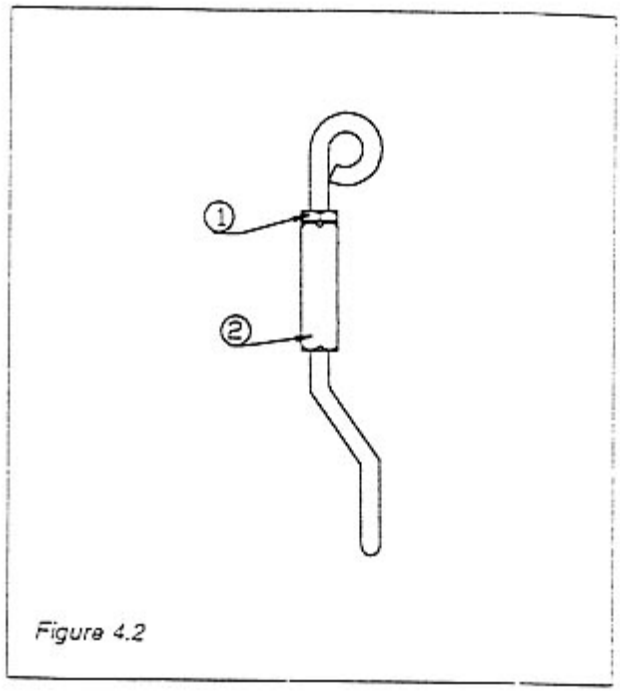


Figure 4.2

d) *Drive Wheel Surface*

The driving surfaces of the wheel must not be contaminated with any lubricant or silicone Aerosols etc., as this will affect the feeding. Clean the tapered groove with solvent if contamination is suspected.

4.2 Dense Stitch Size

The size of the dense stitches themselves may be altered using the adjustment nut 2 on the dense stitch adjuster located underneath the machine bed. By losening nut 1 and rotating nut 2 clockwise the size of the dense stitches will increase. When the correct size is achieved use nut 1 to lock nut 2 in position. See fig 4.2.

4.3 Number of Dense Stitches

The A.M.F. Reece controller is set to give a timed sequence of dense stitches at the start and end of stitching. These two conditions can be altered by tenths of a second to give longer or shorter length of dense stitch.

The speed of the dense stitch may be altered to faster or slower (see Section 5.3).

4.4 Needle Reverse

The Efka motor may be programmed to take the needle to its highest position, when thick cloth is being used. This allows the presser foot to be set higher without needle protruding. (see Section 12, Efka Manual 3.3, – Increments for Revision).

4.5 Turn Arm / Variable Speed Setting Instructions

1. To obtain uniform stitching on radiussed corners it is necessary to find the machine speed that is matched to the speed of the torque arm. This is done by altering slow sew speed in A.M.F. Reece controller (see Section 5.3.4). Small stitches on a corner indicate too fast a machine speed, so this would require the speed to be lowered. Large stitches at the corner indicate too slow a machine speed. Correct this by increasing speed in A.M.F. Reece controller.

2. Actuation of the torque arm is caused by the photocell being energised after it has cleared the first piece of tape on the corner of the jig, it is returned when it is de-energised by the second piece of tape which is placed after the corner. It is possible to turn approx. 175° (see Figure 4.5).

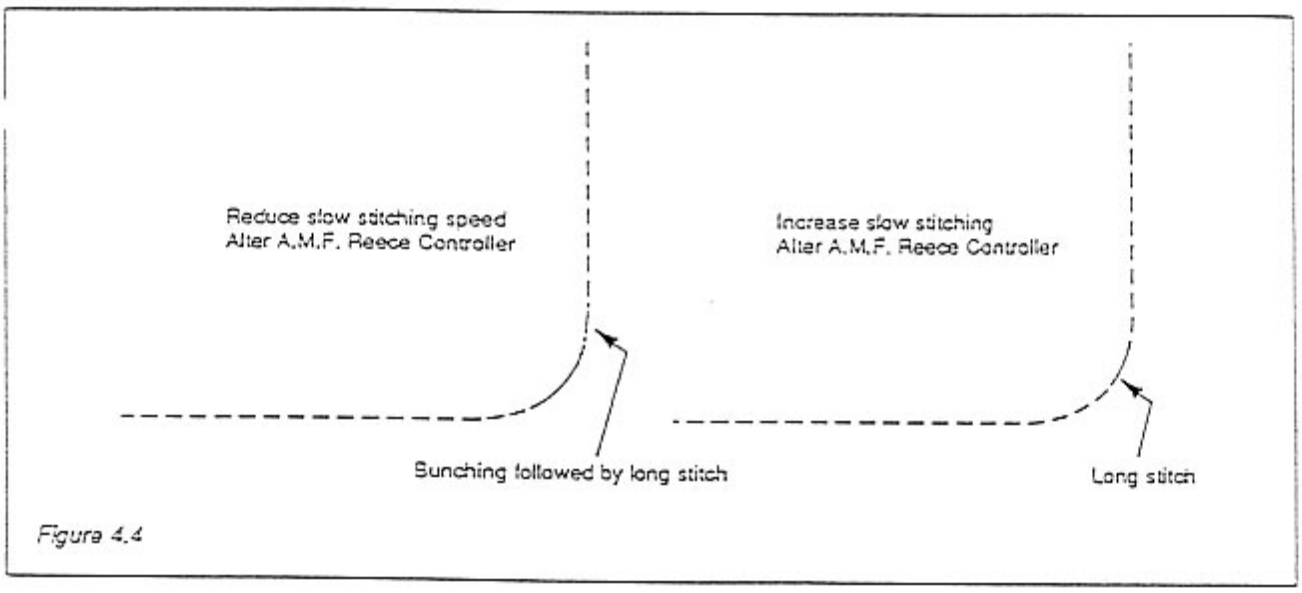


Figure 4.4

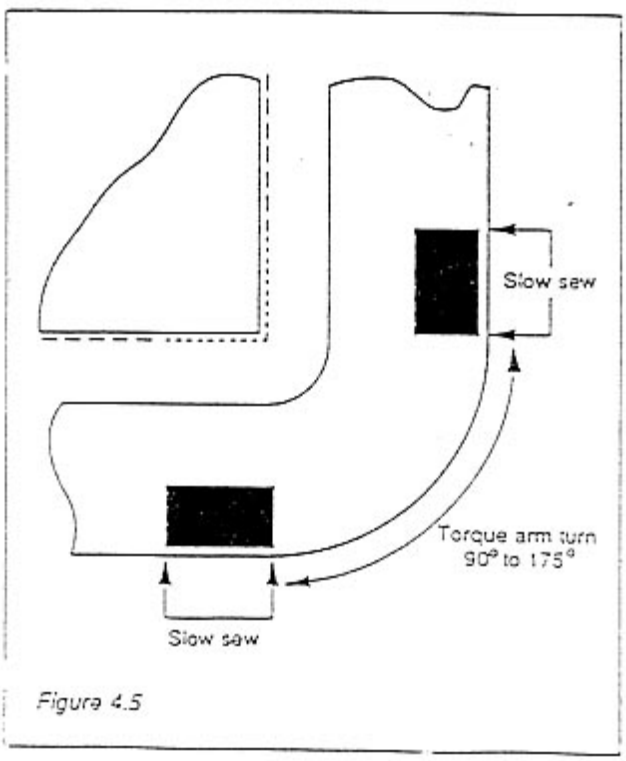


Figure 4.5

3. The turn arm has a 20mm cylinder fitted. This is in return position when torque arm is at rest, this is to allow jigs with internal radii to pass underneath. Also fitted to the torque unit are two flow controls; these restrict the exhausted air to ensure that the jig turns smoothly.

TAPE POSITION AT CORNERS (Guide only)

4.6 Photo-Electric Switch

a) Hints on correct use

Make sure the lens of the switch is kept clean so as not to inhibit the function of this unit.

CAUTION:
DO NOT CLEAN WITH ALKALI, AROMATIC HYDROCARBON, CHLORIDE HYDROCARBON, AS THE LENS MAY BE DISSOLVED BY THESE.

b) Indication

The green and red indicators turn on and off as shown in Figure 4.4. Set the sensitivity adjuster at an appropriate position so that the photo-electric switch operates within the stable operating range.

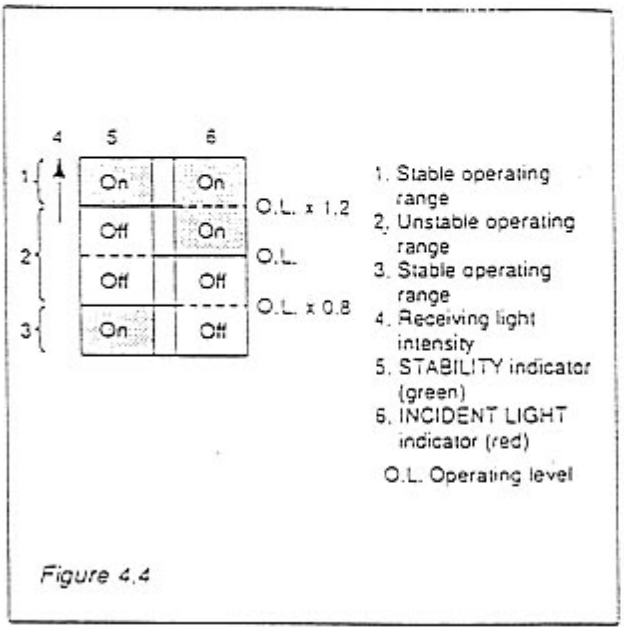


Figure 4.4

c) Sensitivity Adjustment

CAUTION:
WHEN ADJUSTING SENSITIVITY DO NOT TURN THE SENSITIVITY ADJUSTER BEYOND ITS MAXIMUM SCALE POSITION, OTHERWISE THE ADJUSTER WILL BE DAMAGED.

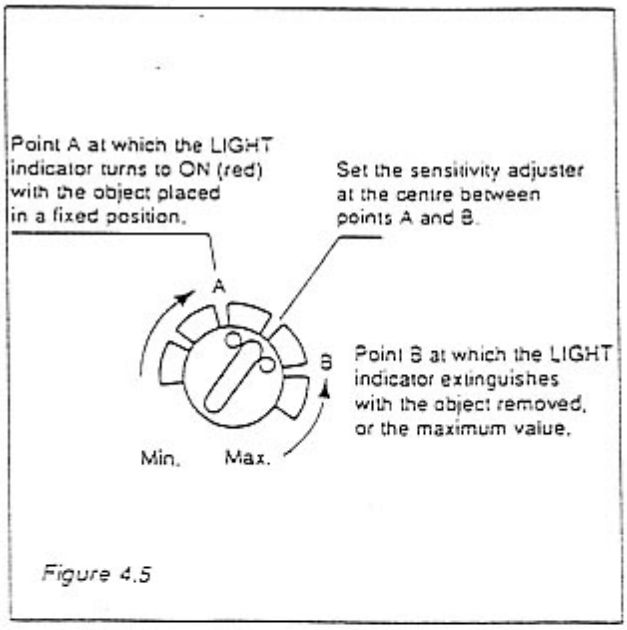


Figure 4.5

4.5 Side Knife Adjustment

Fine adjustment of the side knife may be done on the clamping bracket. This is illustrated as item 4 in fig. 56 on page 7.8.

The knife engage and disengage stop positions are adjusted on the knife lever shown as item 9 on page 10.7, for finer adjustment the clevis pin shown as item 8 on page 10.7 should be used. When the knife is engaged it should not bottom out in the throat plate and when disengaged should not move when de selected.

5.1 Preface

The A.M.F. Reece controller expands the facilities of machine control to provide a new level of understanding between the operator and machine. By interpreting the messages sent to and from the jig controller it turns the system into a powerful centre for control, instruction and reporting.

It is a two way dialogue for virtually any machine control needed.

For basic control:

> PLEASE LOAD JIG

For changing machine setting:

> KNIFE DELAY = 0.8 sec

For fault diagnosis:

> SYSTEM CHECK ?

5.2 Instructions – Definitions

When the A.M.F. Reece controller powers up the first message that appears on the display is the machine type and software version number. New versions of software are developed to provide improvements to existing features, new features and correction of software errors. (If the software version needs to be changed then follow exactly the instructions on software release note).

AMF – REECE (c)
Controller V 1.0

The controller then runs a quick self-test on the electronics and if no malfunctions are found then the last used program number will be set and displayed. There are up to six program numbers available. The displayed message is called the RUN or SEW menu.

[RUN] Program 2
Position Jig

5.2.1 *General Controller Program Blocks*
– MOVING AROUND

NOTE 1:
Capital printed letters is text on the display.

NOTE 2:
This example explains program structure for detailed information go to 5.3.1).

	MENU NAME	VIEWED ON DISPLAY	BUTTON PRESSED
a)	Run menu	[RUN] PROGRAM 2 > PLEASE LOAD JIG	Power On
b)	Main menu	1.Systemcheck 2.Edit 3.Counter 4.Sequence	Press Cntr
c)	System check menu *line 1*	1. INPUT TEST ? 1. YES	Press No. 1 To select systemcheck
	line 2	2. OUTPUT TEST 1. YES	Press up arrow To select next test
	line 1	1. INPUT TEST ? 1. YES	Press down arrow To select previous test

MENU NAME	VIEWED ON DISPLAY	BUTTON PRESSED
c.1) Input test		Press No. 1 To select the input test
	1. START BUTTON [OFF]	
		Press up arrow To select next input
	2. PHOTOCELL [ON]	
		Press down arrow To select previous test
	1. START BUTTON [OFF]	
line 2		Press Cntr To end input test
	2. OUTPUT TEST 1. YES	
c.2) Output test		Press No. 1
	1. JIG DRIVE 1. ON/OFF 2. END	
line 3		Press No. 2 To end output test
	3. POSITION TEST 1. YES	
main menu		Press Cntr To go to main menu
	1.Systemcheck 2.Edit 3.Counter 4.Sequence	

MENU NAME	VIEWED ON DISPLAY	BUTTON PRESSED
d) Programing menu *line 1*	SELECT PROGRAM NO < 1 TO 6 >	Press No. 2 To select edit
	1. DENSE TIME DELAY = 0.5 SEC	Press No. 2 To select program 2
	1. DENSE TIME E DELAY = 0.5 SEC	Press Edit To select Edit mode
main menu	1.Systemcheck 2.Edit 3.Counter 4.Sequence	Press Cntr To go to main menu
e) Counter menu	TOTAL SEWING CYCLES [00035620001]	Press No. 3 To select counter
b) Main menu	1.Systemcheck 2.Edit 3.Counter 4.Sequence	Press Cntr To end counter menu
a) Run menu	[RUN] PROGRAM 2 > PLEASE LOAD JIG	Press Cntr To return to Run menu

5.3 Step By Step Guide and Keypad Functions

(For Version 1.8s)

NOTE:
When the machine is sewing the keypad is disabled. Most of the keys on the controller keyboard are allocated more than one function.

5.3.1 *The Run Menu*

Button	Description
1 to 6	Program selection
Reset	Set the controller back to the initial settings. This function can be used if the jig is loaded incorrectly, after pressing reset the jig will be ejected.
Knife	This keypad button turns the knife OFF or ON when pressed once again. The state of the knife function can be viewed on the display.
Down Arrow	No function in run/sew menu.
Edit/Save	No function in run/sew menu.
Up Arrow Counter	When these two buttons are pressed together starting with the down arrow button first and then the counter button. Then the batch counter will be displayed. This counter can count up to 9999 pieces.
Up Arrow Reset	When these two buttons are pressed together, starting with the down arrow first and then the reset button. Then the batch counter will be reset to zero. This does not effect the total sewing counter.
Cntr	This is the control button. This button will be used to switch between the various menus. When pressed at Run/sew menu the display will display the main menu.

5.3.2 *The Main Menu*

Cntr	This button will take the program back to the run menu.
1 to 6	At display from the main menu button 1 to 6 will take the program to any of the options displayed in this menu.
Example:	1. Systemcheck 2. Edit 3. Counter 4. Sequence

5.3.3 *Systemcheck*

When entering the systemcheck menu the required test can be selected by using the up or down arrow buttons.

Example:	1. Input test	1. YES
	2. Output test	1. YES
	3. Position test	1. YES
	4. Restore program	1. YES

Once the correct test is displayed press No. 1 to select the test. If cntr button is pressed the program will return to the main menu.

INPUT TEST

By pressing the up or down arrow buttons the input name displayed will change. When the input to be tested is selected then on the second line of the display the current state of the input is displayed. This will be ON or OFF. When switching the selected input the ON/OFF state on the display will change according to the input.

Available inputs

- Start button
- Photocell 1

To end this test press cntr. This will take the program back to the Systemcheck menu.

OUPUT TEST

By pressing the up or down arrow buttons the output name displayed will change. When the output to be tested (in this case jig drive), is selected then the following message is displayed.

```
1. JIG DRIVE
1. ON/OFF  2. END TEST
```

When the number one button is pressed the output will be turned on or off. (Reversed from the previous state). The current state for the output is pointed out by a blinking digit. When ON is blinking the output is turned active. When pressing number one OFF will start blinking

The next output can be selected by pressing the up/ down arrow buttons. When the next output is selected then automatically the previous output will be turned off.

When pressing number two the output test will end and the program returns to the systemcheck menu leaving all outputs off. Pressing the control button will take the program to the main menu again leaving all outputs in the off state.

Available outputs

1. Knife
2. Jig Flap
3. Dense Cylinder
4. Jig Drive
5. Jig Turn
6. Jig Eject
7. Presser Foot
8. Motor Line 1
9. Motor Line 2
10. Motor Line 3
11. Motor Line 4

NOTE:
Some selected outputs will switch two outputs at once, the two outputs will be displayed. This function is a built-in safety measure if damage could occur when setting a single output.

POSITION TEST

By pressing one of the numbers displayed the positioning of the sewing motor can be tested.

1 Needle up

2 Needle down

3 Stop and end test

cntr. Stop and end test

RESTORE PROGRAM

This function can be used to restore the six standard programs to the factory settings.

WARNING
ALL PROGRAMMED DATA WILL BE CHANGED.

```
4. RESTORE PROGRAM
1. YES
```

If number one is pressed the following message is displayed

```
ARE YOU SURE ?
1. YES
```

Press number 1 once again to use this function. While restoring the data the display shows:

```
– SAVING DATA –
```

5.3.4 *The Edit Menu*

The edit menu is used to build or change the six sew programs. The following parameters can be recalled or programmed and stored into non volatile memory according to the application.

1	Fast Sew
2	Double Jig
3	1st Jig Corner
3a	1st Corner Slow Speed
4	2nd Jig Corner
4a	2nd Corner Slow Speed
5	3rd Jig Corner
5a	3rd Corner Slow Speed
6	4th Jig Corner
6a	4th Corner Slow Speed
7	Empty
8	Knife Delay Start
8a	Time-ON, Tape-OFF
8b	Knife Delay Time
9	Knife Delay End
10	Dense into Corner
11	Start Dense Time
12	End Dense Time
13	Start Dense Speed
14	Slow Sew Speed
15	Needle Down Speed
16	Max Sewing Speed
17	Jig Flap Action
18a	Speed to Corner 1
18b	Speed to End
19a	Auxilliary Drive
19b	Select Second Program
20	Photocell Retry Quantity

The Up and Down arrow keys are used to move between the parameters. The value or setting for a particular parameter stored in user memory is displayed on the second line of the screen.

If the program setting needs to be altered then first the EDIT button has to be pressed. Once this button is pressed the letter E is displayed in the right top corner of the display. This indicates that if the arrow buttons are pressed the data will be changed. By pressing the EDIT/SAVE button once again the data can be saved or the edit mode turned off.

NOTE:
It is only possible to alter settings when E for EDIT is displayed. If for any reason the programmed setting has been changed but you later decide that this altered data should not be saved then press the CNTR button. This will turn the edit mode off (Removes E from top right corner) but will not store the new data into memory.

Again the controller has safety features that only allows the selected data to be altered between min and max limits.

Pressing Cntr will return the program to the main menu.

5.3.5 *Total Counter*

When number 3 is pressed when the main menu is displayed the total sewing counter can be viewed. This counter is stored in non volatile memory and increment every jig cycle.

5.3.6 Batch Sequencer.

This is used to allow different styles of jigs to be run consecutively. For example production requirements may demand a collar followed by two cuffs to be sewn in succession.

By pressing 4 in the main menu, this facility is accessed.

1.Systemcheck 2.Edit 3.Counter 4.Sequence

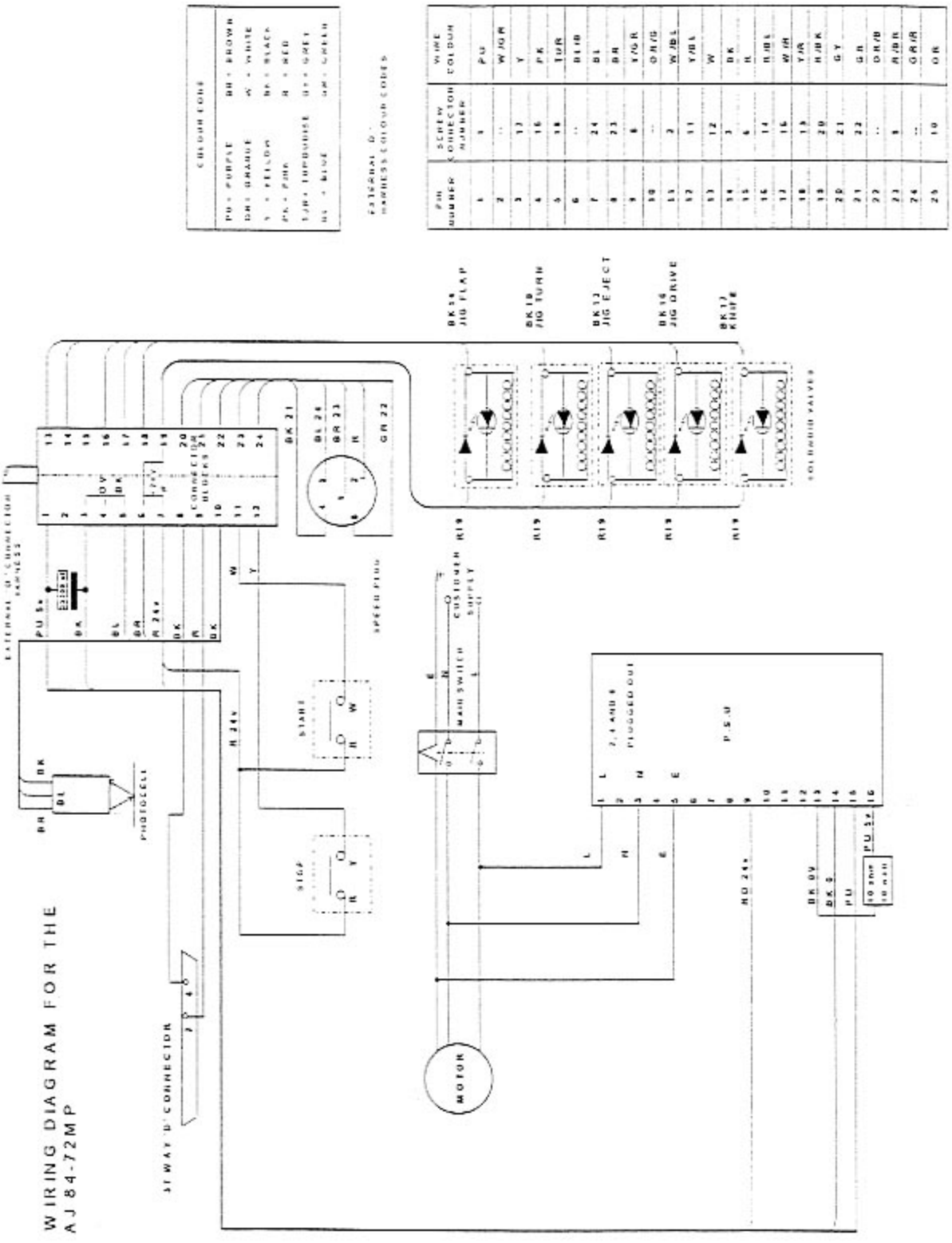
Once accessed, the function may be activated by pressing 1 or deactivated by pressing 2.

Select JOG Function Press <1> on,<2> off

The required sequence may then be entered

Select Sequence ? ? ? ? ? ?

Control is then pressed to leave this option.


WIRING DIAGRAM FOR THE
AJ84-72MP
MOTOR
P.S.U
PHOTOCELL
SOLENOID VALVES
BK 18
JIG FLAP
BK 19
JIG TURN
BK 12
JIG EJECT
BK 16
JIG DRIVE
BK 17
KNIFE

The pneumatics are switched by a bank of solenoid valves located inside the cabinet door. Air is normally on the 'B' lines. When a solenoid valve is energised, the air is transferred to line 'A'.

6.1 JIG FLAP.

When solenoid is energised this allows air through line A1 causing jig flap to lift.

6.2 JIG TURN.

When solenoid is energised this allows air through line A2 causing turn arm to function and turn jig. When solenoid is de-energised this allows turn arm to return to rest position, air through line B2.

6.3 JIG DRIVE.

When solenoid is energised this allows air through line A3 causing jig eject cylinder to operate. When de-energised this allows air to line B3 causing jig eject cylinder to return.

6.4 JIG DRIVE.

When solenoid is energised this allows air through line A4 causing jig drive cylinder to operate and grip jig. When solenoid is de-energised this allows air through B4 causing jig drive to return.

6.5 KNIFE.

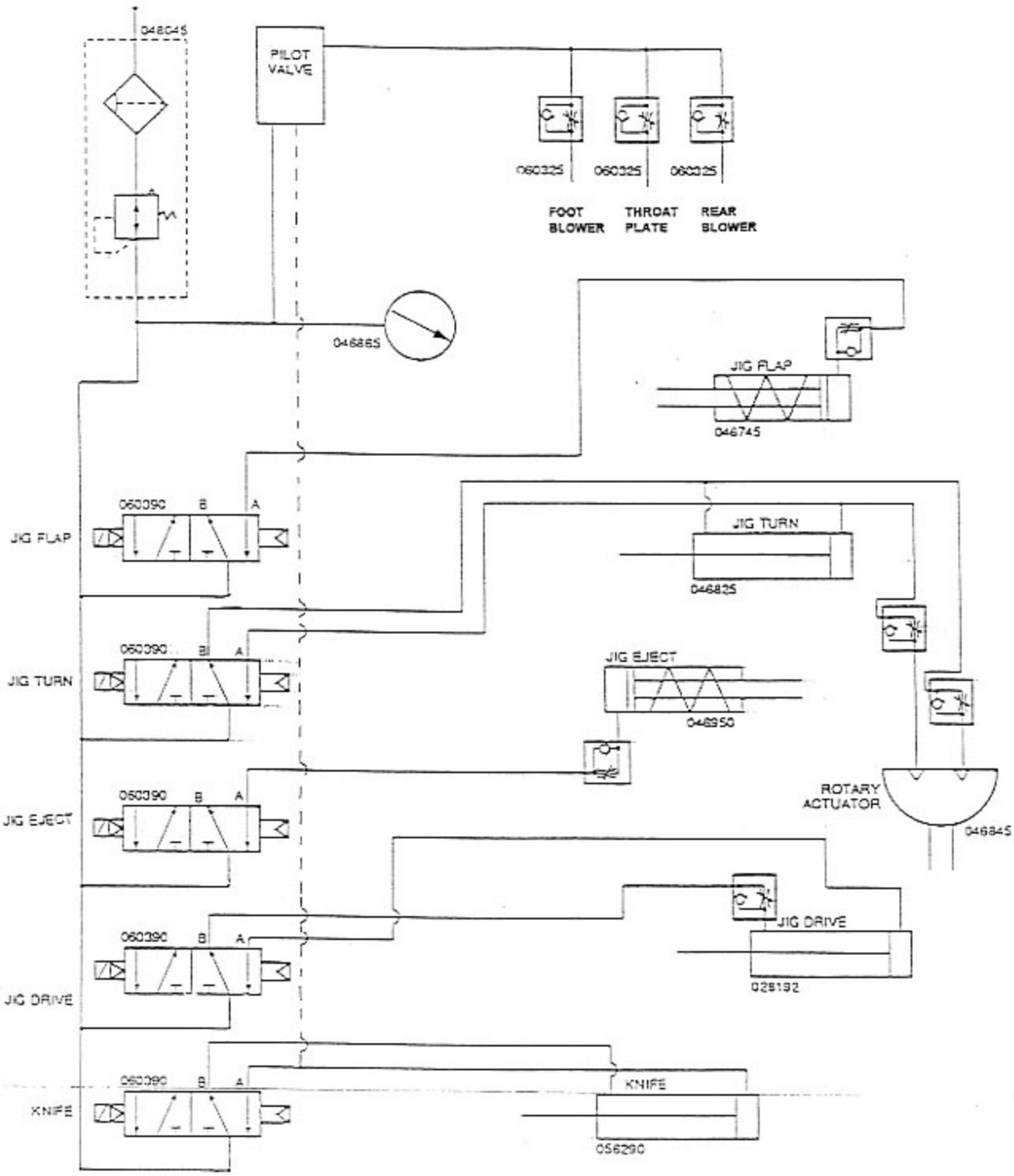
When solenoid is energised this allows air through line A5 causing knife to engage and allowing air to foot and rear blower. When solenoid is de-energised this allows air through B5 causing knife to return to up position, and removes air from waste blowers.

6.6 AIR BLOWERS.

There are three blowers fitted to the machine: one to the throat plate, one to the foot and one to the rear of the machine. All blowers should be set so they dispose of trimmed material to the rear of the machine.

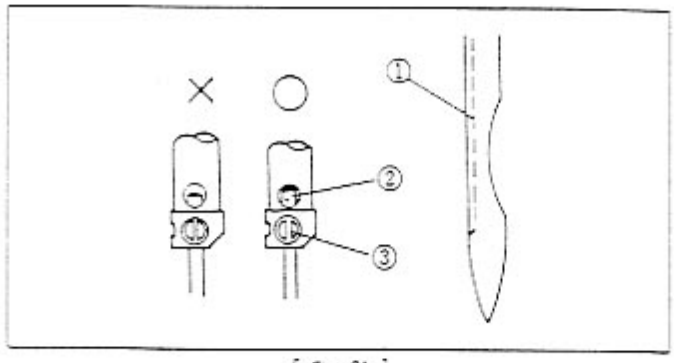
6.7 AIR FLOW REGULATORS.

Most air cylinders are fitted with flow control valves, to adjust the speed of operation of the air piston. For example, drive wheel cylinder (fig 4.1, item 2) must be adjusted so that the drive wheel is brought smoothly into contact with the edge of the jig, otherwise damage may be caused to the jig.


048045
PILOT VALVE
060325
060325
060325
FOOT BLOWER
THROAT PLATE
REAR BLOWER
046865
JIG FLAP
046745
060390
B
A
JIG FLAP
JIG TURN
046825
JIG TURN
JIG EJECT
048950
JIG EJECT
ROTARY ACTUATOR
046845
JIG DRIVE
028192
JIG DRIVE
KNIFE
056290
KNIFE

7.1 Needle Insertion.

Hold the lower punch mark of the needle '1' to face the left. Then make the end of the needle butt up to the upper side of the stopper hole '2'. Then secure the needle with the fixing screw '3'. (Refer to fig. 31)



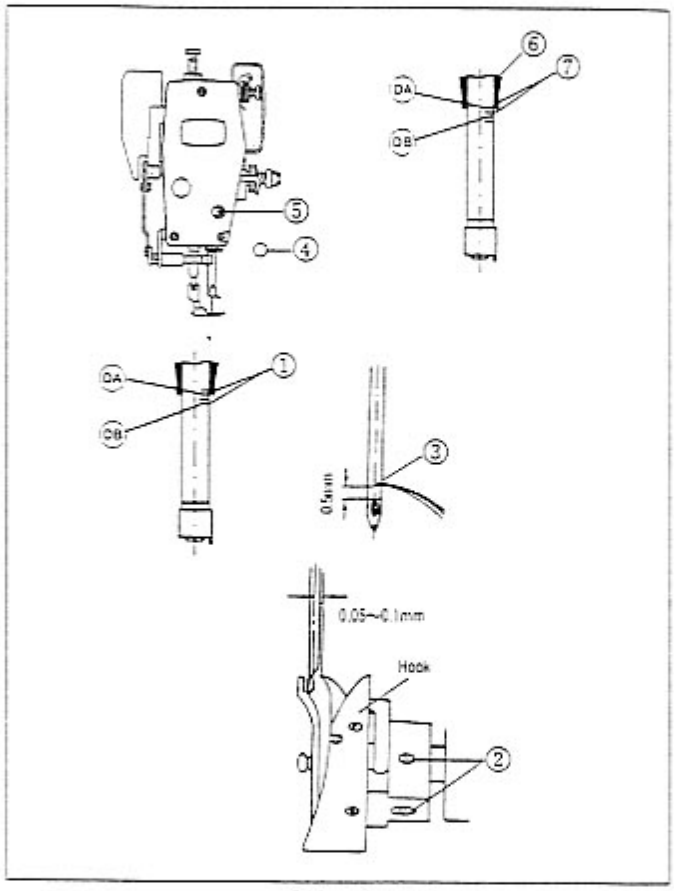
[Fig. 31]

7.2 Adjusting The Needle Bar.

As shown in Fig. 32, remove the rubber plug '4' from the front cover. Rotate the pulley to move the needle to it's lowest position. Then release the needle fixing screw '5'. Align the upper punch mark '7' on the needle bar with the bottom end of the needle bar lower bushing '6' and then tighten the screw '5' and fit the rubber plug '4'.

7.3 Adjusting The Timing Of The Needle Hook.

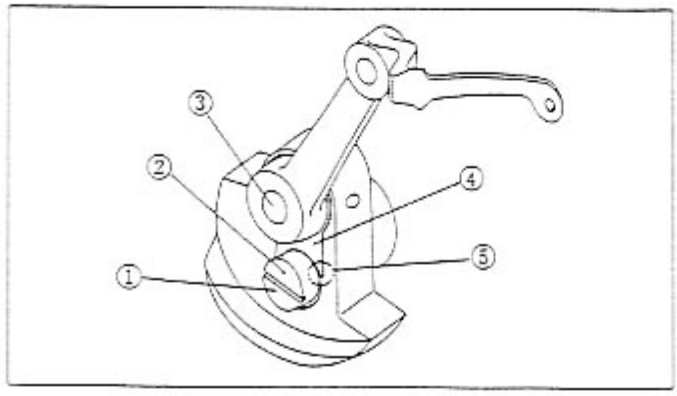
As shown in fig. 32, align the lower punch mark of the needle bar '1' with the end of the lower needle bar bushing '6' and release the three fixing screws '2'.
With the point of the hook '3' set to the centre of the needle adjust the point of the hook to give 0.05-0.1mm gap.
Tighten the three screws '2'.



[Fig. 32]

7.4 Adjusting The Lubrication of the Thread Take-up Lever.

As shown in fig. 33, when the dot '2' marked on the head of the oil adjusting pin '1' aligns with the centre of the thread-take up crank shaft hole '3', the maximum amount of oil is released. If the adjusting pin is turned towards the marks '5', the amount of oil released will be reduced. If the dot '2' passes marks '5', no oil will be released.



[Fig. 33]

7.5 Regulation Of Amount Of Oil Supply To Hook.

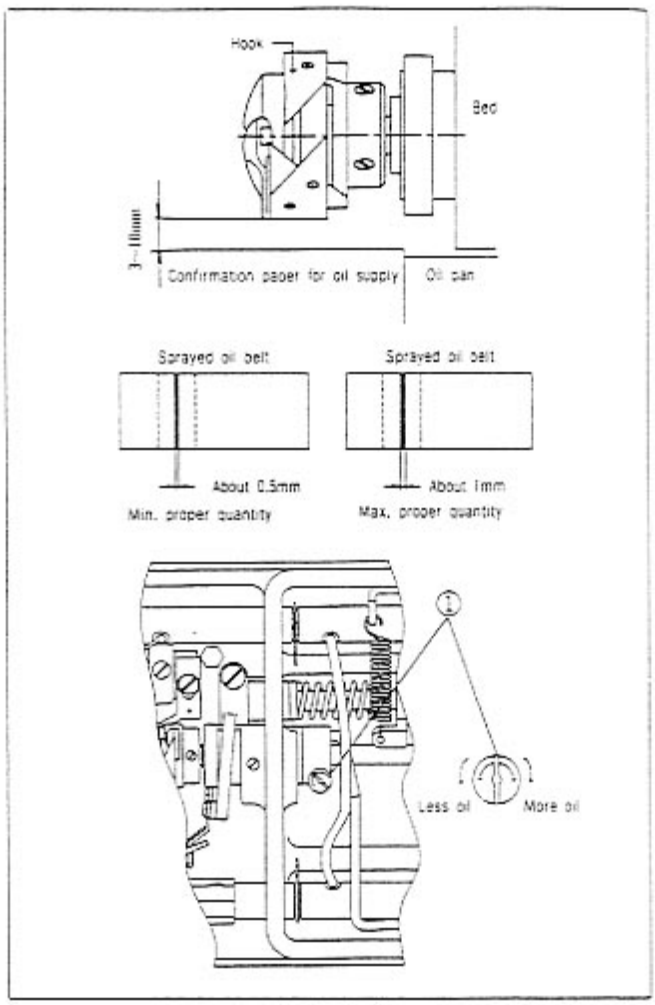
A. Measuring amount of oil supplied.

1. Run the sewing machine on full speed for 3 minutes. Place a piece of paper in position as shown in fig. 34, and run machine for a further 5 seconds. The amount of oil being supplied can now be seen.

2. Repeat this process a further 3 times making sure the oil being supplied is within the limits shown in fig 34.
Too much oil could stain the material being sewn. Too little can cause the hook to seize.

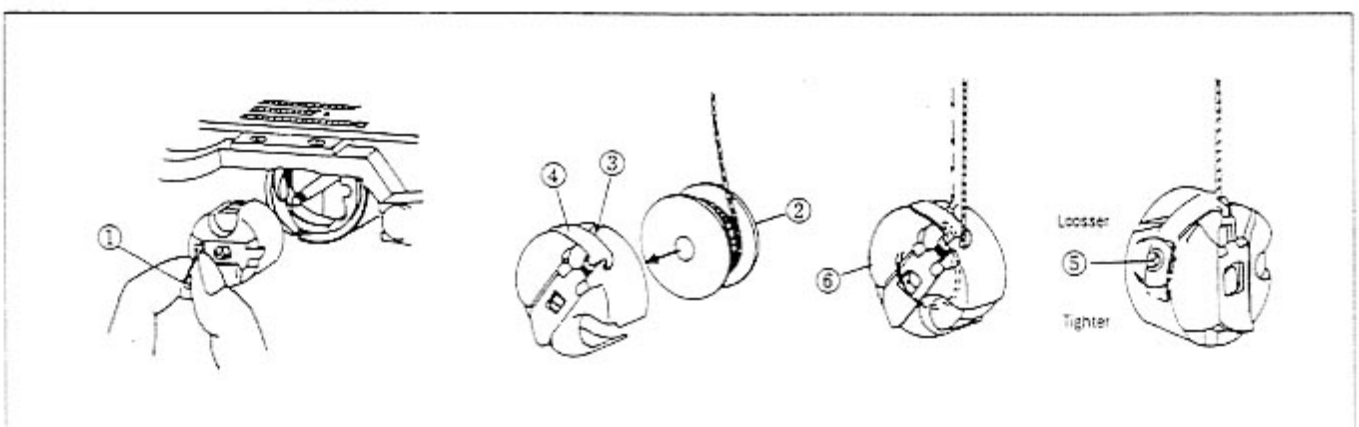
B. Oil Supply Adjustment.

Turning the adjusting screw clockwise, as shown in fig. 34, will **Increase** the oil flow, turning the screw counter clockwise will **Decrease** the oil flow.



[Fig. 34]

7.6 Lower Thread Take Up and Tension Adjustment.



[Fig. 35]

A. Spool Fitting and Tension Adjustment.

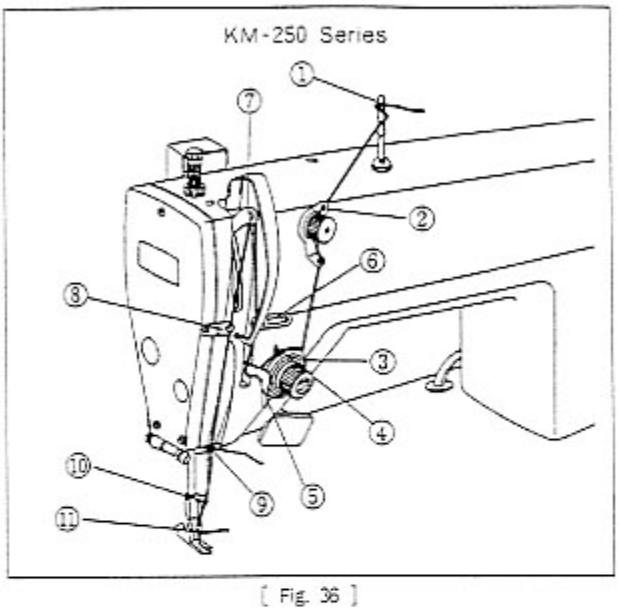
Refer to fig 35. Fit the spool '2' into the spool case '6.' Insert the thread spool in the groove '3.' Then hook the thread under the thread tension adjusting spring '4.' Rotating the tension adjusting screw '5' clockwise, increases the thread tension, rotating the tension adjusting screw '5' anti-clockwise decreases the thread tension. Adjust the thread tension so that the spool case will gradually drop under its own weight.

B. Insertion and Removal of Spool Case.

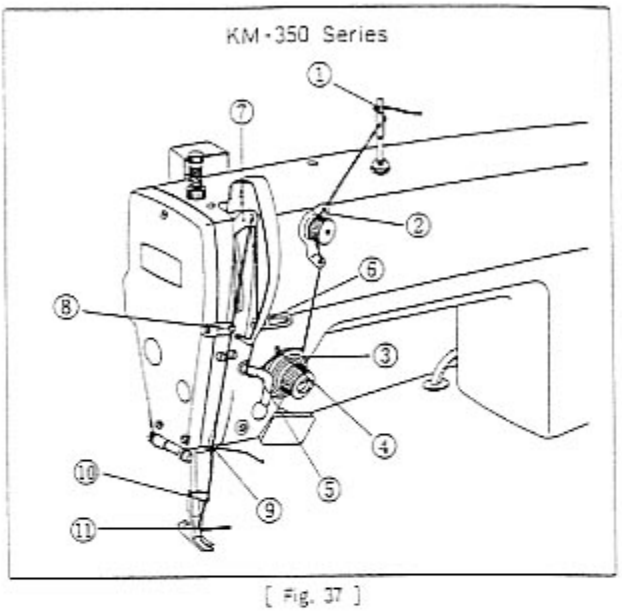
Refer to fig 35. Hold the spool case lever '1' and push the case into the hook. When removing, hold the spool case lever and pull it out of the hook.

7.7 Upper Thread Path.

Place the thread at the optimum position, then insert the upper thread according to the sequential numbers in fig. 36, 37.



[Fig. 36]



[Fig. 37]

7.8 Upper Thread Adjustment.

A. Main Thread Adjusting.

As shown in fig. 38, turning the tension adjusting screw '1' clockwise increases the upper thread tension. Adjust the tension of the thread according to the material being sewn, the thread and the number of stitches.

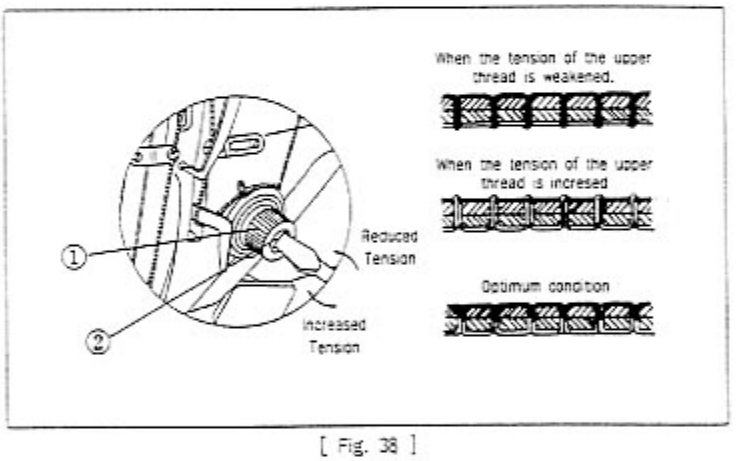
B. Tension Adjustment of Check Spring.

As shown in fig. 38, rotating screw '2' will increase the check spring tension.

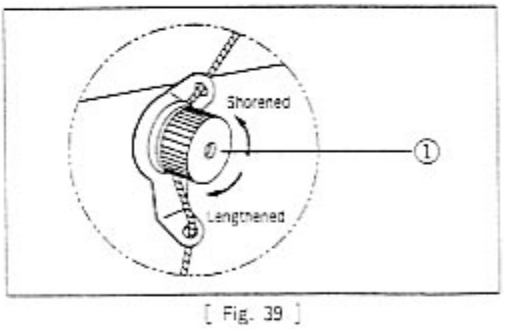
C. Thread Pre-Tension Adjustment.

As shown in fig.39, rotating the pre-tension screw '1' clockwise, the length of trimmed thread will be reduced. The optimum length of the remaining thread after trimming is 30-40mm.

D. Adjusting Thread Release Unit.

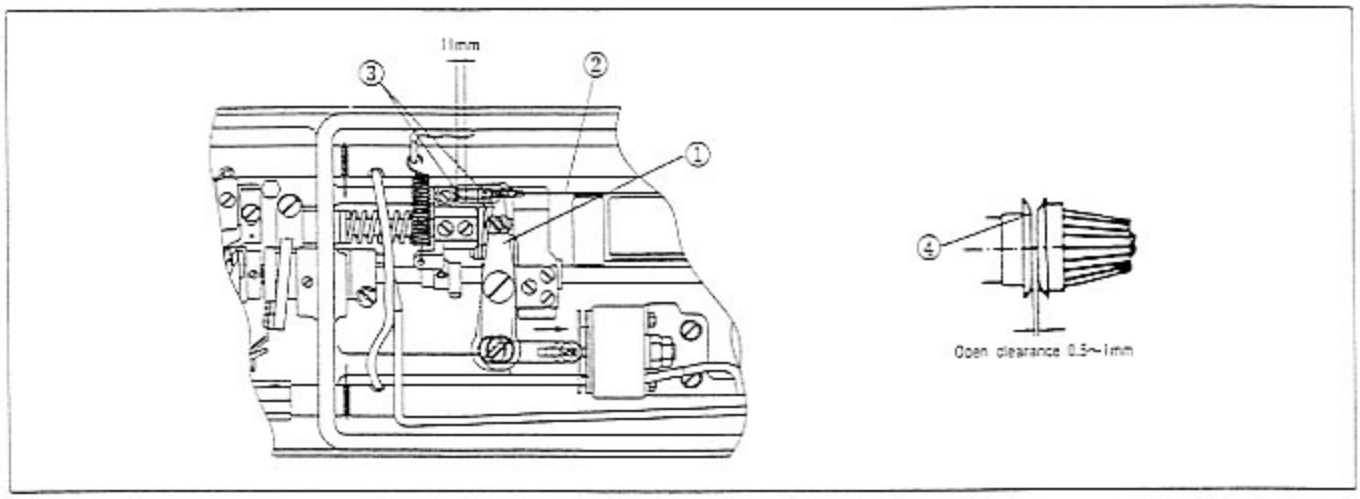


[Fig. 38]



[Fig. 39]

The thread release unit is operated by the movement of the thread trimming solenoid. As shown in fig. 40 the thread release gap can be adjusted by moving the thread release cable wire '2' which is attached to the thread release operation lever '1.' Release the two fixing nuts '3.' Then move the cable wire '2' to the left and tighten the nuts '3.' The thread release gap will have increased. If the cable '2' is moved to the right the gap will be decreased. Adjust the cable to give a gap of 0.5-1mm between the discs '4' when the thread release is operated. Ensure the discs are closed when the lever is released. The stroke of the thread release lever '1' is 5mm. Adjust the lever so that the discs '4' do not open during the first 2mm of lever travel and that they are open when the lever is pulled 2-5mm. Refer to fig. 40.

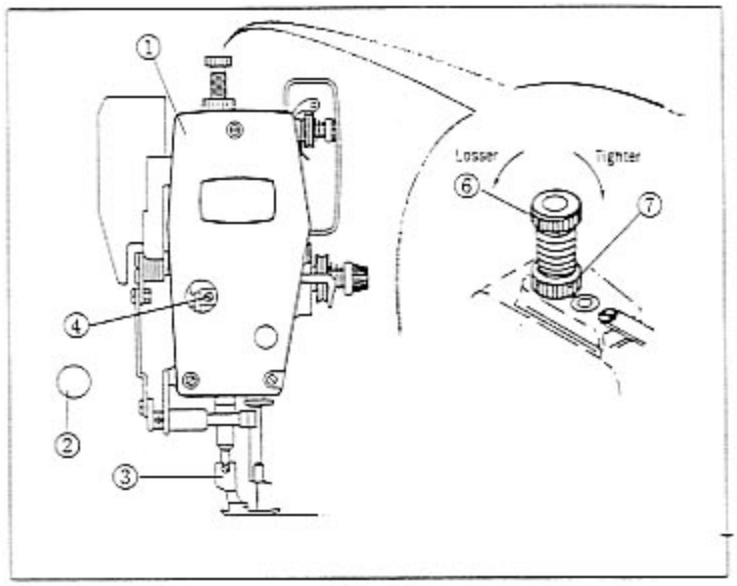


[Fig. 40]

7.9 Presser Foot Height and Pressure Adjustment.

A. As shown in fig. 41, remove the rubber plug '2' from the cover plate '1.' With the needle in the 'up' position and the presser foot '3' also in the 'up' position make sure the needle point is not showing below the presser foot. If the needle point is visible then release the presser bar holder screw '4' and adjust the holder until the foot covers the needle. Once the adjustment has been carried out check the presser foot will both clamp the jig in the 'down' position and also allow the jig to be loaded in the 'up' position.

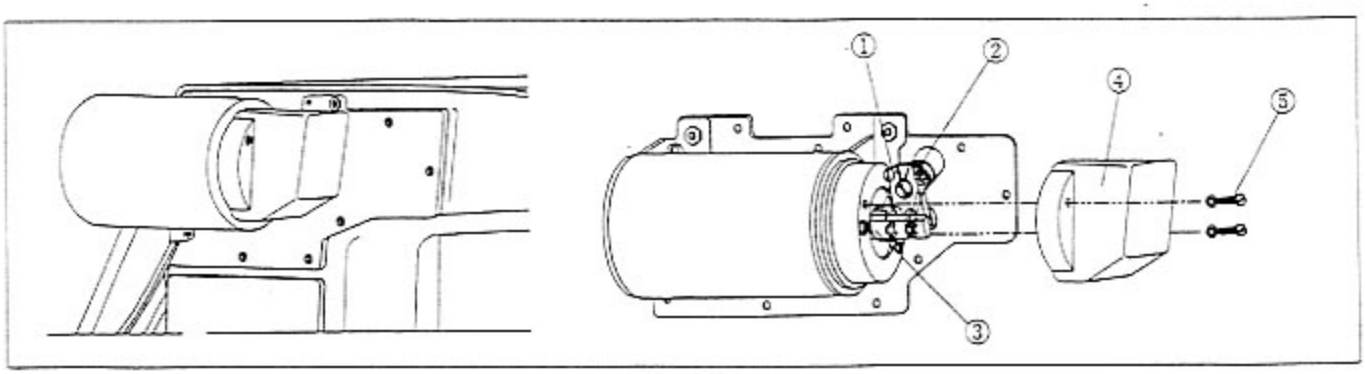
B. Adjustment of the presser foot pressure. As shown in fig. 41 rotating the adjusting screw '6' clockwise increases the foot pressure. After adjustment use nut '7' to lock adjusting screw '6' in position.



[Fig. 41]

7.10 Presser Foot Solenoid Adjustment.

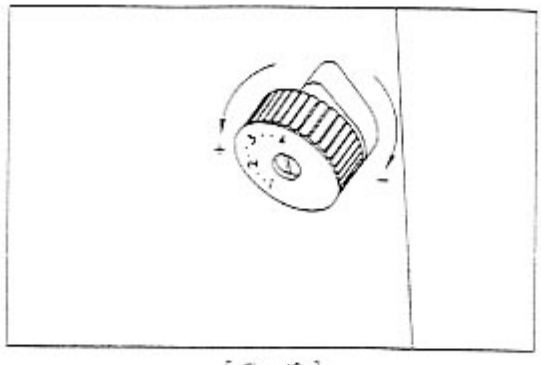
Presser foot travel can be adjusted on the presser foot solenoid crank '3.' Referring to fig. 42 Release the screws '5' securing the solenoid cover '4'. Release screw '2' for the solenoid crank pivot. Rotating the pivot '1' clockwise will increase the foot travel, anti clockwise will reduce the presser foot travel.



[Fig. 42]

7.11 Stitch Length Adjustment.

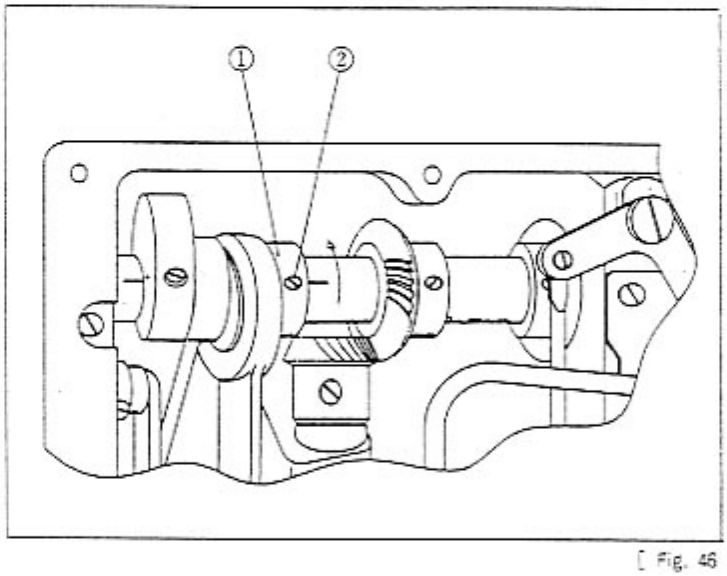
As shown in fig. 43 the dial '1' increases stitch size when turned anti-clockwise and reduces the stitch size when turned clockwise.



[Fig. 43]

7.12 Feed Cam Adjustment.

When the feed timing is correct the jig should be moved just after the needle has left the material. To obtain this timing remove the plate holding the presser foot lift solenoid and locate the feed cam '1' as shown in fig. 46. After releasing screw '2,' rotate the cam clockwise to advance the feed, or rotate the cam counter clockwise to retard the feed. Tighten screw '2' when finished.

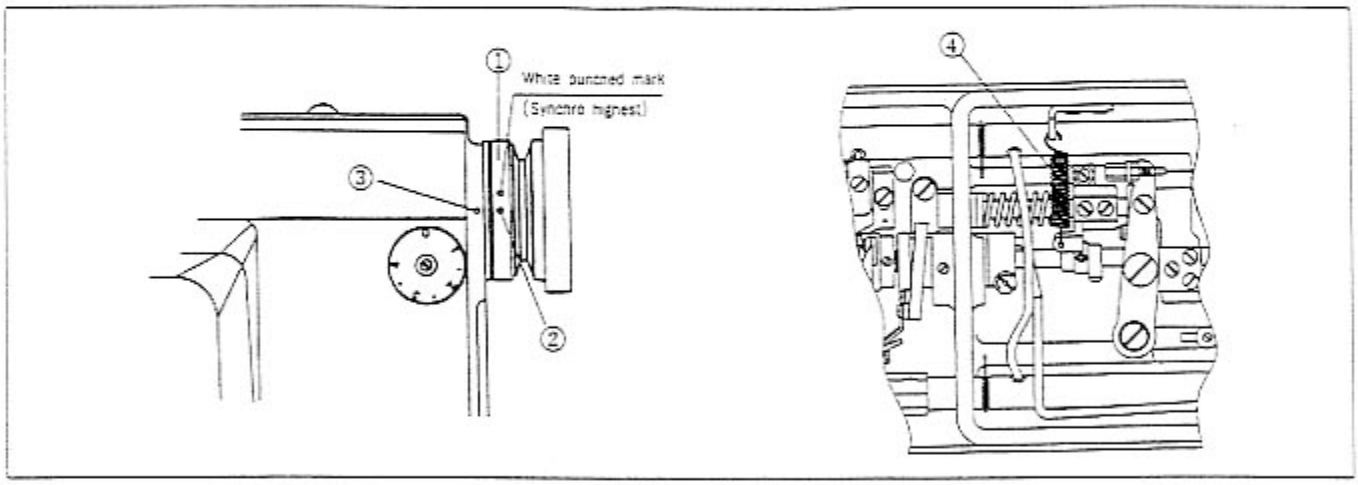


[Fig. 46]

7.13 Thread Triming Timing Adjustment.

A. Refering to fig. 48 line up mark '2' on hand wheel with punch mark '3' on head.

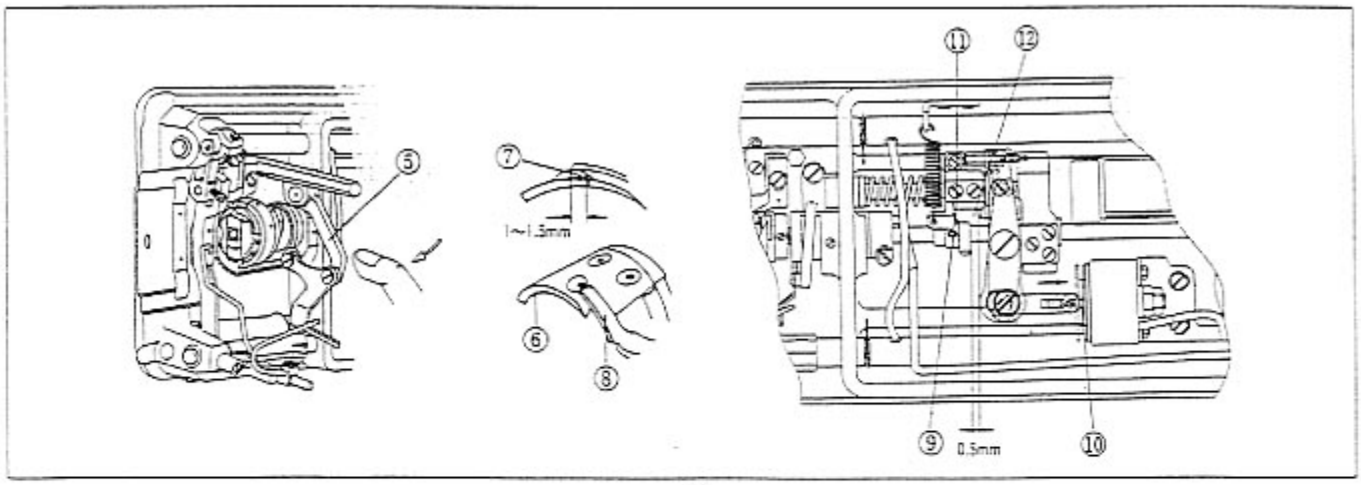
B. Remove spring '4' as shown in fig. 48.



[Fig. 48]

C. Referring to fig. 49, push trimming blade '6' up until fixed knife '8' is 1-1.5mm onto mound '7.'

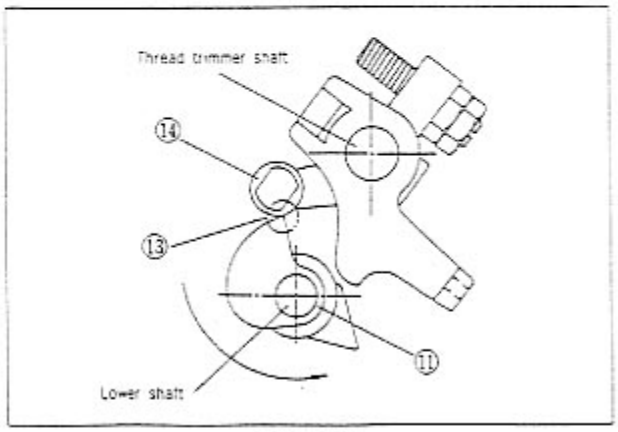
D. Referring to fig. 49, push thread trimming solenoid '10' in with screw '9' of the thread trimming cam slackened. The distance between trimming cam '11' and roller screw '12' is 0.5mm.



49

E. Tighten up screw '9' for the thread trimming cam after adjustment. Check the roller of cam '11' with roller '14' by rotating thread trimming cam '11' by hand. Refer to fig. 50.

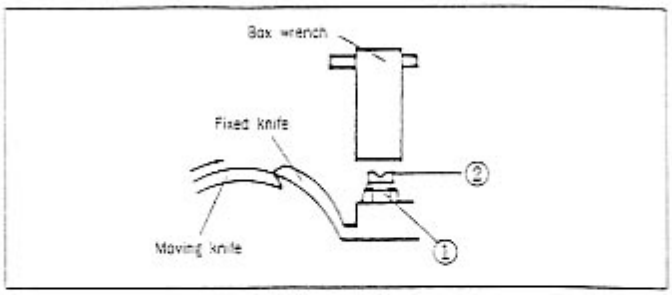
F. Connect return spring '4.'



[Fig. 50]

7.14 Fixed Knife Tension Adjustment.

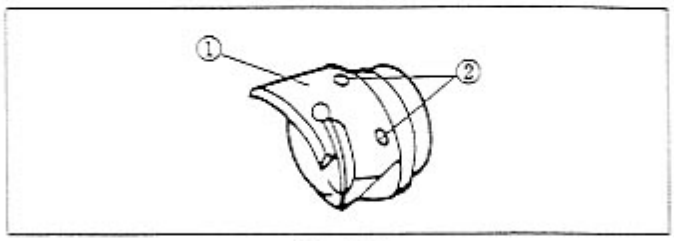
Release the tension adjusting nut '1' with a box spanner and release the tension adjusting screw '2.' As shown in fig. 51 push the moving knife towards the fixed knife until it's blade point meets the fixed knife point. Tighten the fixed knife tension adjusting screw '2' until the two blades touch without force. Tighten the tension adjusting nut '1.'



[Fig. 51]

7.15 Replacing The Moving Knife.

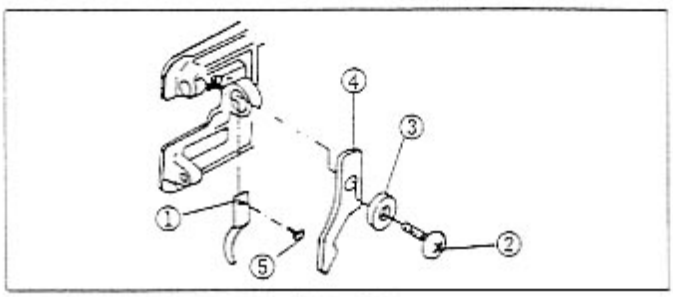
Ensure the needle is in the 'up' position and remove the throat plate. Referring to fig. 52 undo the two screws '2' and remove the moving knife '1.' Fit the new knife and tighten all screws.



[Fig. 52]

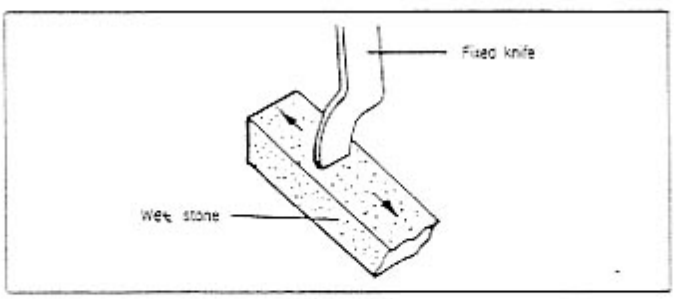
7.16 Replacing The Fixed Knife.

A. To replace the fixed knife '1' release the spool case positioning finger fixing screw '2' as shown in fig. 53 and remove washer '3' and finger '4.'
Remove the fixed knife screw '5' and then remove the fixed knife.



[Fig. 53]

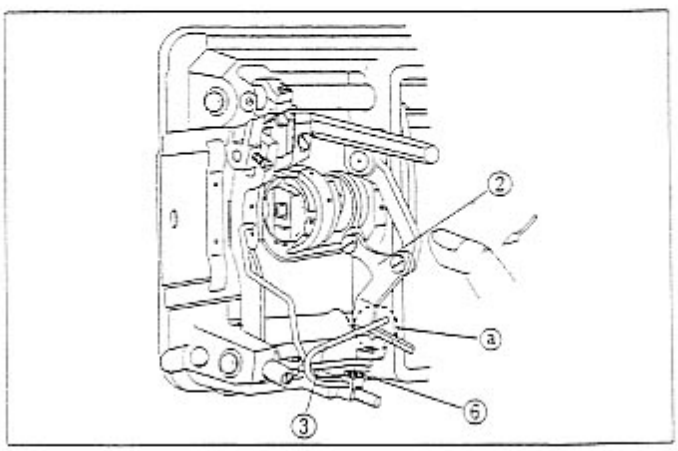
B. If the point of the blade is dull sharpen using an oil stone. Refer to fig 54.



[Fig. 54]

7.17 Bobbin Catcher Adjustment.

As shown in fig. 55 with the spool catcher lever '3' relaxed, release the fixing screws '6' and adjust the lever '3' until it is touching the bottom of the connector link '2' as shown by 'a.'

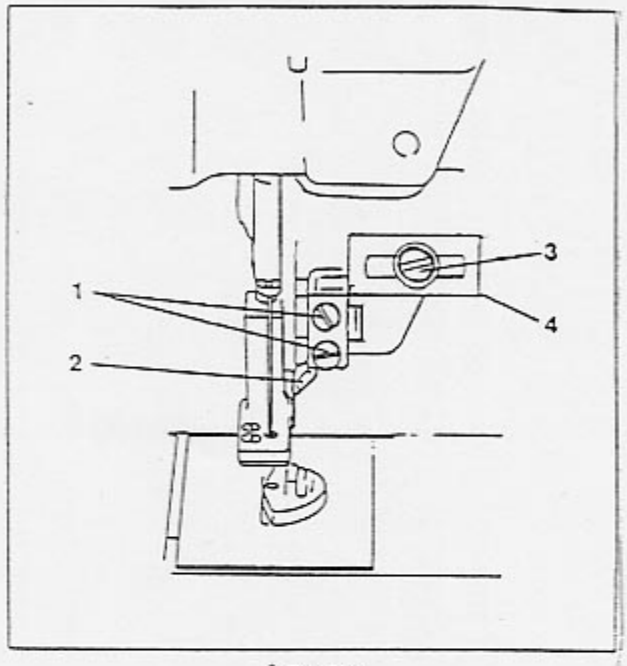


[Fig. 55]

7.18 Side Knife Replacement and Adjustment.

When the knife is engaged it should cut cloth cleanly without having excessive pressure on the throat plate.

Referring to fig. 56 loosen screws '1' and remove knife '2.' Insert new knife and, with the knife in it's lowest position, adjust knife holder '4' by releasing screw '3' and pushing knife upto throat plate. Tighten all screws.



[Fig. 56]

7.19 Sewing Head Trouble Shooting.

NO	Problem	Check	Cause	Maintenance
1	The needle is broken	Needle facing.	The needle is inserted incorrectly	Replace the needle correctly
		Needle	The needle is bent	Replace the needle
			Improper feed dog timing	Adjust the operating time
		Raised height of the needle bar	Improper needle and rotary hook timing	Adjust the operating time
		Height of the needle bar	Improper needle and rotary hook timing	Adjust the operating time
		Clearance between the needle and the hook	Improper needle and rotary hook timing	Adjust the operating time
2	The thread is cut.	Threading	Threading is incorrect	Rethread it
		Needle	The needle is bent or damaged	Rethread the needle
		Needle facing and height	The needle is incorrectly inserted	Reinstall the needle correctly
		Upper thread tension	The tension is too tight	Adjust the tension adequately
		Lower thread tension	The tension is too tight	Adjust the tension adequately
		Stroke of the thread take up spring	The upper thread is loose	Adjust the thread take-up spring
3	The stitching is passed over	Needle facing and height	The needle is inserted incorrectly	Reinstall the needle correctly
		Needle	Needle is bent or damaged	Replace the needle
		Threading	Threading is incorrect	Replace the needle
		Raised height of the needle bar	Improper needle and rotary hook timing	Adjust the operating time
		Height of the needle bar	Improper needle and rotary hook timing	Adjust the operating time
		Clearance between the needle and the hook	Improper needle and rotary hook timing	Adjust the operating time
			Remains of the upper thread is too short	Adjust it with the thread tension adjusting unit.
		Bobbin case spring for preventing additional rotation	During the thread trimming, the bobbin rotates additionally. So, the bobbin thread coming from the bobbin case is too short to be raised up.	Change the spring for preventing the rotation.
		Thread take-up spring	The tension of the thread take-up spring is too losse to raise up the bobbin thread.	Adjust the stroke of the thread take-up spring

8.5 SYNCHRONISER SETTING

8.5 Synchroniser (Figure 8.5)

When sewing is interrupted with trim signal the machine should first stop with the needle bar positioned about 4mm past bottom dead centre, then proceed to trim and stop in take up lever up position.

a) Check the trimming speed, this should be 180 r.p.m. For adjustment, refer to EFKA manual (parameter 110 - section 7.4).

b) Remove the protecting cap of the synchroniser.

c) Display the EFKA motor stop positions (Parameter 172 - see EFKA manual, section 7.8).

d) Use the AMF Reece controller to position needle down (alternatively, use the EFKA hand plunger).

Holding the central disk with pliers, turn the hand wheel antil clockwise, until the needle reaches the lowest position. Then, keep turning the hand wheel past this position slightly, so that the lower of the two needle bar markers shows below the sewing head.

e) Use the AMF Reece controller to position needle up.

Holding the outer disk with pliers, turn the hand wheel antil clockwise, until the needle reaches the highest position. Then, turn the hand wheel slightly, so that the thread take up lever is in it's top turning point.

f) Check that the gap between the inner and central disks is 25mm.

g) Check both needle up and needle down positions.

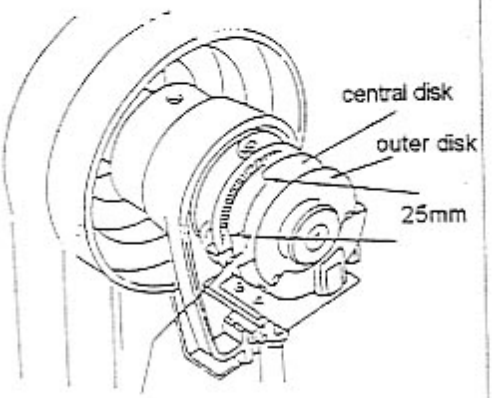


Figure 8.5

9.1 Stitching

FAULT	CAUSE	CORRECTION
9.1.1 Random thread breakage	Problem with thread path (including the throat plate and presser foot).	Remove burrs from thread path.
	Problem with the sewing hook.	Remove burrs, clean & polish. Check the hook point. Check the clearance between the hook and the bobbin case opener lever. Check lubrication.
	Thread is caught somewhere in the thread path.	Correct threading.
	Tension is wrong.	Adjust tension.
	Thread take-up spring misadjusted.	Adjust the take-up.
	Problem with needle.	Check or replace.
	Spool spin.	Fit friction washer.
	Material wrongly positioned in jig.	Ensure all stitching is in material.
	Jig damage.	Repair jig.
9.1.2 Slip stitching	Problem with the needle.	Check for needle damage and for correct needle orientation. Check that the needle size is correct for the thread being used.
	Problem with the sewing hook.	Check to see if the hook point is blunt or worn. Check the hook timing.
	Needle thread tension is too high.	Decrease the tension.
	Sewing head speed is too high.	Reduce the motor speed.
	Thread take-up spring misadjusted.	Adjust the take-up.
	Material flagging.	Check jig is clamping material. Check presser foot.
9.1.3 Short end on top or needle unthreads	Tension release mechanism.	Check that tension release is functioning properly.
	Underbed moving knife or counter knife out of setting.	Reset trimming, section 6.

9.1 Stitching

	FAULT	CAUSE	CORRECTION
9.1.4	Thread not trimmed	Thread catcher moved.	Reset synchroniser and trimming.
		Loose plug on solenoid lead.	
		Loose plug on synchroniser.	
		Synchroniser loose on handwheel.	Reset synchroniser, section 8.
		Sewing hook slipping last stitch.	Check to see if hook point is blunt or worn. Check hook timing.
		Blunt or misadjusted thread trimming knives.	Check knives.
9.1.5	Thread not picked up	Short end on spool thread due to "Spool Spin".	Increase the the pressure of the bobbin case holder positioning finger. Increase the bobbin thread tension.
		The pressure of the bobbin case holder positioning finger is too high.	Decrease pressure of the finger, but check for "spool spin" - see above.
9.1.6	Spool thread picked up late after first few stitches	Short end on needle thread.	Correct as 9.1.3.
		Short end on spool thread.	Correct as 9.1.5.
9.1.7	First few stitches looped underneath	Foot lift cylinder sluggish on return.	Remove, cleanand lubricate.

9.2 Machine Controls

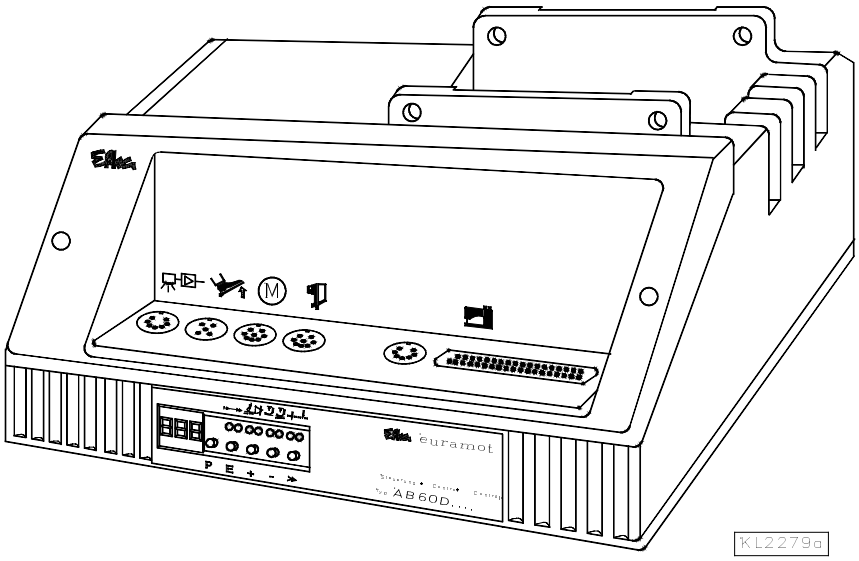
	FAULT	CAUSE	CORRECTION
9.2.1	Machine fails to start	Jig in wrong position	Reset and return jig to machine correctly
		Excessive cloth thickness jig	
		Drop in air pressure	Check 80 PSI (5.5 Bars) on gauge
		Din plug loose	Re-connect
		Synchroniser plug out	Re-connect
		Wire off start button	Re-solder
9.2.2	Machine fails to stop	No tape at end	Add tape
		Photo-cell missing tape	Re-position tape
		Photo-cell not clearing tape at end of jig	Re-position tape
9.2.3	Machine fails to position	Wrongly programmed in Efka motor	See Section 8.5 Needle positions
9.2.4	Machine runs slow	Missed a signal from tape	Check position of tape
		Photo-cell	

9.3 Feed

	FAULT	CAUSE	CORRECTION
9.3.1	Small stitches	Worn drive wheel	Replace
		Damaged jig	Repair
		Excessive foot pressure	Reset to 1.5 - 2.0 kg
9.3.2	Large stitches	Presser foot not in contact with jig	Re-set presser bar, Section 3.10
		Pressure foot pressure almost zero	Re-set to 1.5 - 2.0 kg
9.3.3	Dense stitch fails to operate	Feed lever adjustment bracket screw loose	Re-set and tighten
9.3.4	Large stitches on corner	Corner speed too slow	Adjust speed by altering corner speed in A.M.F. Reece controller, Section 5.3.4
		Turn cyl movement too fast	Slow down through flow control
9.3.5	Small stitches on corner	Corner speed too fast	Adjust speed by altering corner speed in A.M.F. Reece controller, Section 5.3.4
		Turn cyl movement too slow	Speed up through flow control
9.3.6	Irregular profile at corner	Needle down switch selection for round corner	Switch to slow run position
9.3.7	Jig fails to stitch slow at corners	No signal check tape position	Reset tape position check photo-cell receiving signal
9.3.8	Jig fails to stitch a sharp corner	Photo-cell faulty	Replace
		Sensitivity	Re-set to sense black tape on jig
		Wrong program selected	Select correct program

Efka euramot

CONTROL AB60D1472



INSTRUCTION MANUAL

No. 402289 English

Efka
FRANKL & KIRCHNER
GMBH & CO KG

Efka
EFKA OF AMERICA INC.

Efka
EFKA ELECTRONIC MOTORS
SINGAPORE PTE. LTD.

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CONTENTS **Page**

1 Important Safety Instructions

When using an EFKA drive and accompanying devices (e g for sewing machines), basic safety precautions should always be followed, including the following:

- Read all instructions thoroughly before using this drive.
- Drive, its accessories and accompanying devices should be mounted and put into operation by qualified personnel in accordance with the guidelines provided in the instruction manual.

To reduce the risk of burns, fire, electric shock, or personal injury:

- Use this drive only for its intended use as described in the instruction manual.
- Use only attachments recommended by the manufacturer or as contained in the instruction manual.
- Do not operate without corresponding protective devices.
- Never operate this drive if one or more parts (e. g. cables, plugs) are damaged, if it is not working properly, if any damages can be identified or are to be suspected (e. g. after it has been dropped). Only qualified personnel are authorized to make adjustments, eliminate faults and complete repair work.
- Never operate the drive with the air openings blocked. Keep ventilation openings of the drive free from the accumulation of lint, dust and loose cloth.
- Never drop or insert any object into any opening.
- Do not use drive outdoors.
- Do not operate where aerosol (spray) products are bong used or where oxygen is being administered.
- To disconnect, turn off main switch, then remove plug from outlet.
- Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.
- Keep fingers away from all moving machine parts. Special care is required e. g. around the sewing machine needle and the V-belt.
- Before mounting and adjusting accompanying devices, i.e. position transmitter, reversing device, light barrier, etc., disconnect drive from mains (turn off main switch, remove mains plug from outlet [DIN VDE 0113 part 301; EN 60204-3-1; IEC 204-3-1]).
- Always switch off (0) machine and remove plug from outlet, when removing covers, mounting accompanying devices, position transmitter especially, light barrier, etc., or any other devices mentioned in the instruction manual.
- Only qualified personnel are authorized to work on the electrical components.
- Work on high voltage circuit areas is forbidden, except as stated in the respective regulations, e.g. DIN VDE 0105 part 1.
- Only specially trained personnel are authorized to complete repair work.
- Cables to be wired must be protected against expectable strain and fastened adequately.
- Cables near moving machine parts (e. g. V-belts) must be wired at a minimum distance of 25 mm (see DIN VDE 0113 part 301; EN 60204-3-1; IEC 204-3-1).
- For safety it is preferred to wire the cables separately from each other.
- Before connecting the mains line make sure that the mains voltage corresponds to the specifications on the motor rating plate and on the nameplate of the power pack.
- Connect this drive to a properly grounded outlet only. See Grounding Instructions.
- Electric accompanying devices and accessories must only be connected to safety low voltage.
- EFKA DC drives are protected according to overvoltage class 2 (DIN VDE 0160 § 5.3.1).
- Observe all safety guidelines before undertaking conversions or modifications.
- For repair and maintenance use only original replacement parts.

Warnings in the instruction manual which point out particular risks of personal injury or risk to the machine are marked with this symbol wherever applicable.

This symbol is a warning on the control and in the instruction manual. It indicates hazardous voltage.

CAUTION – In the case of failure this area can be current-carrying even after having turned the power off (non discharged capacitors).

- The drive is not an independently operating unit, but is designed to be incorporated into other machinery. It must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the EC Directive.

Save these instructions for future reference.

2 Range of Applications

The drive is suitable for lockstitch, chainstitch and overlock machines of various manufacturers. Furthermore, stepping motor operation is possible with the SM210A control. See chapter “Connection Scheme of SM210A Stepping Motor Control”.
With the help of adapter cords (adapter cords see Special Accessories), the drive can be used with the following controls replacing previous models:

Machine manufacturer	**Replacing**	**Machine**	**Model**	**Thread trimming mode**	**Adapter cord**
Aisin	AB62AV	Lockstitch	AD3XX,AD158 3310,EK1	0	1112815
Brother	AB62AV	Lockstitch	737-113,737-913	0	1112814
Brother	AC62AV	Chainstitch	FD3 B257	5	1112822
Dürkopp Adler	DA62AV	Lockstitch	210,270	0	1112845
Global		Chainstitch	CB2803-56	5	1112866
Juki	AB62AV	Lockstitch	5550-6	14	1112816
Juki	AB62AV	Lockstitch	5550-7	14	1113132
Juki	LU1510-7	Lockstitch		20	1113200
Kansai	AC62AV	Chainstitch	RX 9803	5	1113130
Pegasus	AC62AV	Chainstitch	W500/UT	5	1112821
Pegasus	AB60C	Backlatch		8	1113234
Pfaff	PF62AV	Lockstitch	563,953,1050, 1180	0	1112841
Pfaff		Lockstitch	1425	13	1113072
Rimoldi		Chainstitch	F27	5	1113096
Singer	SN62AV	Lockstitch	212 UTT	2	1112824
Union Special	US80A	Lockstitch	63900AMZ	10	1113199
Union Special	US80A	Chainstitch	34000, 36200	4	1112865
Union Special	US80A	Chainstitch	CS100, FS100	4	1112905
Yamato	AC62AV	Chainstitch	VC series	5	1112818
Yamato		Chainstitch	VG series	5	1113178
Yamato	AB60C	Backlatch	ABT3	9	1112826
Yamato		Backlatch	ABT13, ABT17	9	1113205

2.1 Use in Accordance with Regulations

The drive is not an independently operating machine, but is designed to be incorporated into other machinery. It must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the EC Directive (Appendix II, paragraph B of the Directive 89/392/EEC and supplement 91/368/EEC).

The drive has been developed and manufactured in accordance with the relevant EC standards:

EN 60204-3-1:1990 Electrical equipment of industrial machines:
Particular requirements for industrial sewing machines, sewing units and sewing systems.

Operate the drive only:

- on thread processing machines
- in dry areas

CAUTION
When selecting the installation site and the layout of the connecting cable, the Safety Instructions in chapter 1 must be followed with no exceptions.
Particular attention should be paid to maintaining the proper distance from moving parts!

3 Scope of Supply

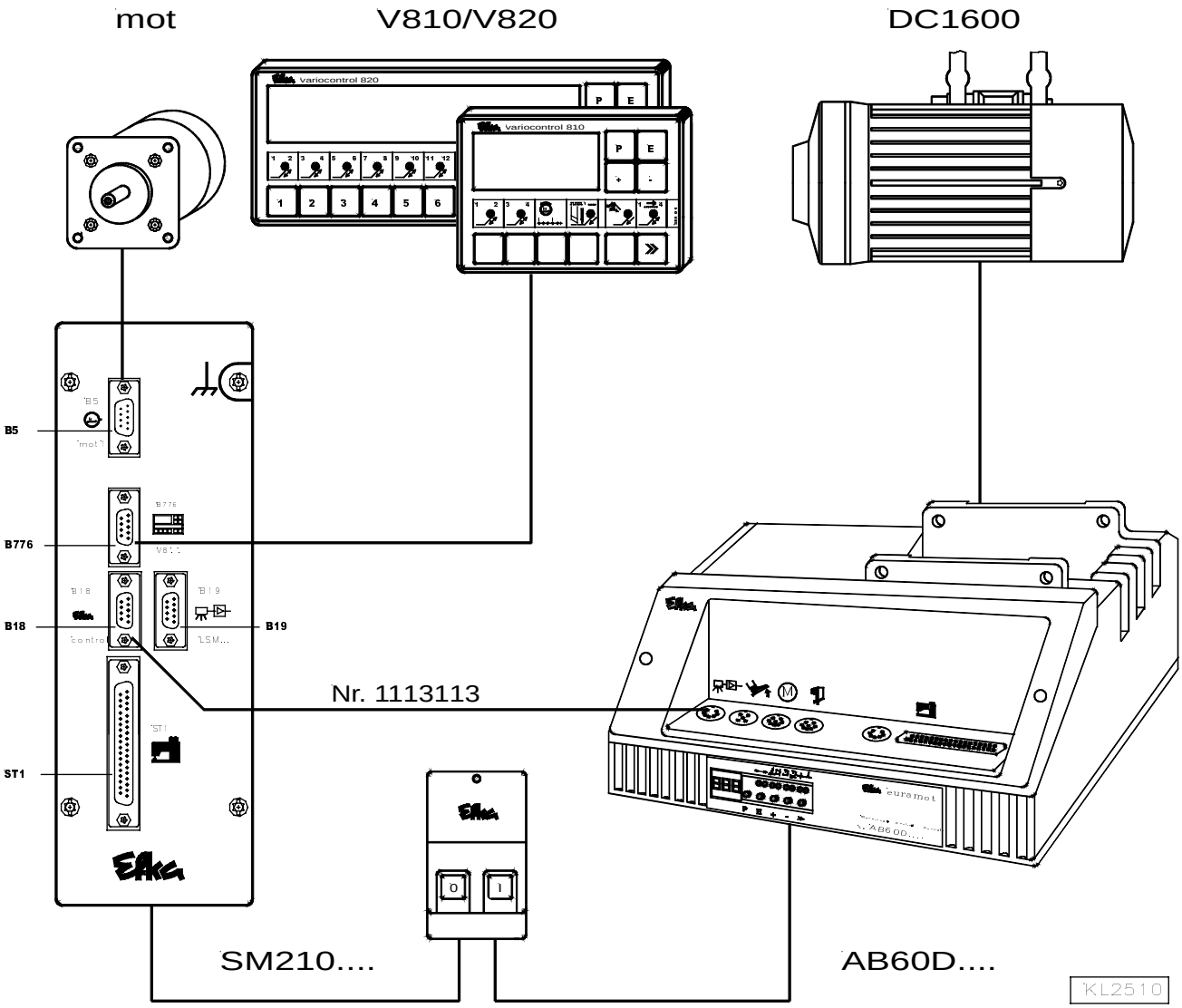
1	Direct current motor	DC1600
1	Electronic control	euramot AB60D1472
	- Power pack	N156A for 230V (optional N159 for 110V)
	- Actuator	EB301 (optional WB302, softer spring)
1	Position transmitter	P5-2 in general P5-4 Singer models 211, 212, 591
1	Mains switch	NS106 (optional NS106d) or NS108 (optional NS108d)
1	Adapter cord according to the intended type of machine	
1	Set of standard accessories consisting of:	B131 belt guard, complete set of hardware motor mounting foot bracket 1 and 2, short potential equalization cord documentation
1	Set of accessories consisting of:	Z3 pitman rod
1	Pulley	

Note
If there is no metallical contact between drive (motor) and machine head, the potential equalization cord supplied with the unit is to be wired from the machine head to the terminal provided on the control box!

3.1 Special Accessories

Reflection light barrier module LSM001A	- part no. 6100028
EFKANET interface IF232-2, complete	- part no. 7900068
Adapter cord for the connection of socket B18 on the SM210 stepping motor control and the above control (see chapter "Connection Scheme of SM210A Stepping Motor Control")	- part no. 1113113
Actuating solenoid type EM1.. (e. g. for sewing foot lifting)	- available models see specification "solenoids"
Extension cable for position transmitter P5-..., approx. 1100 mm long, complete with plug and socket connector	- part no. 1111584
Extension cable for position transmitter P5-..., approx. 315 mm long, complete with plug and socket connector	- part no. 1111229
Extension cable for motor connection, approx. 400 mm long	- part no. 1111858
Extension cable for motor connection, approx. 1500 mm long	- part no. 1111857
Extension cable for external actuator, approx. 750 mm long, complete with plug and socket connector	- part no. 1111845
Extension cable for external actuator, approx. 1500 mm long, complete with plug and socket connector	- part no. 1111787
5-pin plug with locking screw, for the connection of another external actuator	- part no. 0501278
External actuator type EB302 (softer spring) with approx. 250 mm connecting cable and 5-pin plug with locking screw	- part no. 4170012
Foot control type FB301 with one pedal for standing operation with approx. 1400 mm connecting cable and plug	- part no. 4170013
Foot control type FB302 with three pedals for standing operation with approx. 1400 mm connecting cable and plug	- part no. 4170018
Fitting piece for position transmitter	- part no. 0300019
Pulley 40 mm Ø with special belt intake and slip-off protection (use SPZ belt)	- part no. 1112223
Pulley 50 mm Ø with special belt intake and slip-off protection (use SPZ belt)	- part no. 1112224
Knee switch type KN3 (pushbutton) with cord of approx. 950 mm length without plug	- part no. 5870013
Adapter cord for the connection to AISIN high-speed seamer AD3XX, AD158, 3310 and **o**verlock machine EK1	- part no. 1112815
Adapter cord for the connection to BROTHER models 737-113, 737-913	- part no. 1112814
Adapter cord for the connection to BROTHER chainstitch machine model FD3 B257	- part no. 1112822
Adapter cord for the connection to DÜRKOPP ADLER models 210 and 270	- part no. 1112845
Adapter cord for the connection to GLOBAL model CB2803-56	- part no. 1112866
Adapter cord for the connection to JUKI high-speed seamer with index -6	- part no. 1112816
Adapter cord for the connection to JUKI high-speed seamer with index -7	- part no. 1113132
Adapter cord for the connection to JUKI high-speed seamer model LU1510-7	- part no. 1113200
Adapter cord for the connection to KANSAI machine model RX 9803	- part no. 1113130
Adapter cord for the connection to PEGASUS models W500/UT	- part no. 1112821
Adapter cord for the connection to PEGASUS backlatch machine	- part no. 1113234
Adapter cord for the connection to PFAFF models 563, 953, 1050, 1180	- part no. 1112841
Adapter cord for the connection to PFAFF model 1425	- part no. 1113072
Adapter cord for the connection to RIMOLDI model F27	- part no. 1113096
Adapter cord for the connection to SINGER models 211, 212U, 212UTT and 591	- part no. 1112824
Adapter cord for the connection to UNION SPECIAL lockstitch machine model 63900AMZ (as a replacement for the US80A)	- part no. 1113199
Adapter cord for the connection to UNION SPECIAL models 34000 and 36200 (as a replacement for the US80A)	- part no. 1112865
Adapter cord for the connection to UNION SPECIAL models CS100 and FS100	- part no. 1112905
Adapter cord for the connection to YAMATO VC series chainstitch machines	- part no. 1112818
Adapter cord for the connection to YAMATO VG series chainstitch machines	- part no. 1113178
Adapter cord for the connection to YAMATO backlatch machine ABT3	- part no. 1112826
Adapter cord for the connection to YAMATO backlatch machines ABT13, ABT17	- part no. 1113205
Sewing light transformer	- please indicate line voltage and sewing light voltage (6,3V or 12V)
7-pin plug with locking screw (MAS 7100S) in plastic bag	- part no. 1110805
37-pin SubminD male connector with half-shell housing	- part no. 1112900
Single pins for 37-pin SubminD with strand of 5cm length	- part no. 1112899

4 Connection Scheme of SM210A Stepping Motor Control



The AB60D.... control (B18) and the SM210A....stepping motor control (B18) are connected by means of adapter cord no. 1113113.

If a light barrier is required for the sewing process, it must be connected to socket B9 on the stepping motor control. The light barrier signal is transmitted via the connecting cable from the SM210A to the sewing drive.

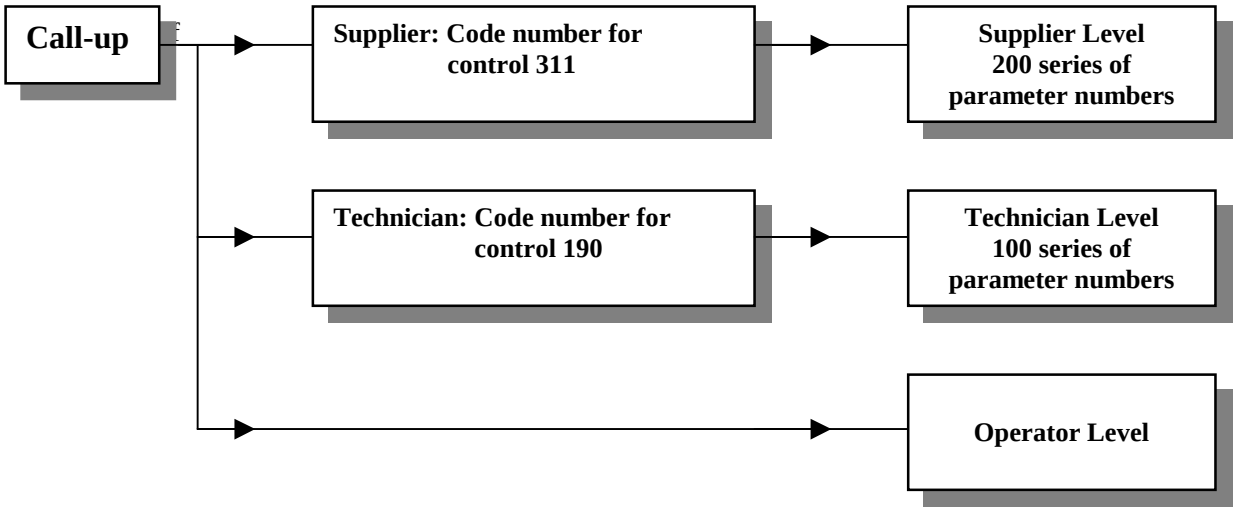
5 Control Operation

5.1 Access Authorization upon Command Input

In order to prevent unintentional changes of preset functions the command input is distributed at various levels.

The following persons have access:

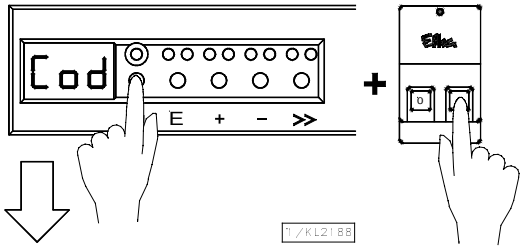
- the supplier to the highest and all subordinate levels by means of a code number
- the technician to the next lower and all subordinate levels by means of a code
- number
- the operator to the lowest level without code number



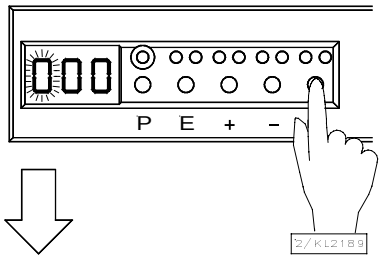
5.2 Programming the Code Number

Note
The parameter numbers in the illustrations below serve as examples and may not be available in all program versions. In this case, the display shows the next higher parameter number. See List of Parameters.

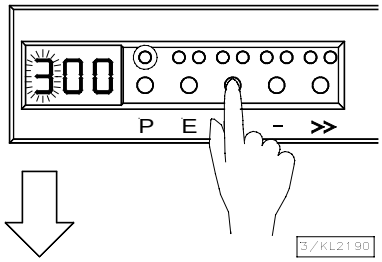
1. Press the **P** key and turn power on



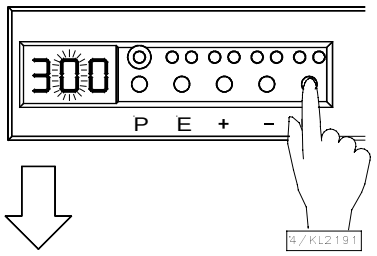
2. Press the >> key (first digit blinks)



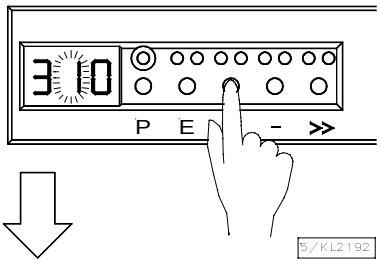
3. Press the + or – key to select the first digit
Technician level ==> Code no. 190
Supplier level ==> Code no. 311



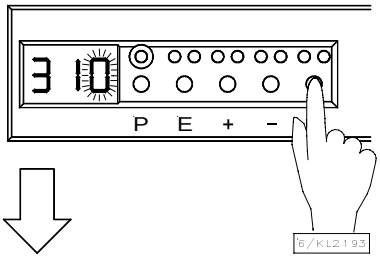
4. Press the >> key (second digit blinks)



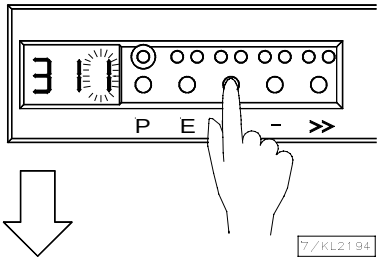
5. Press the + or – key to select the second digit



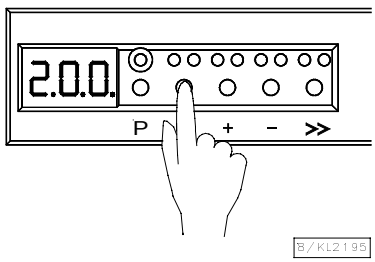
6. Press the >> key (third digit blinks)



7. Press the + or – key to select the third digit



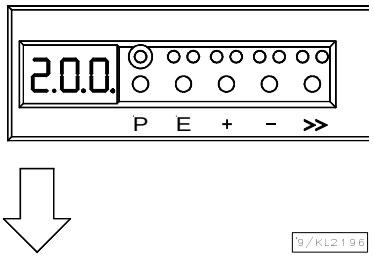
8. Press the **E** key; the parameter number is displayed, which is indicated by points between the digits.



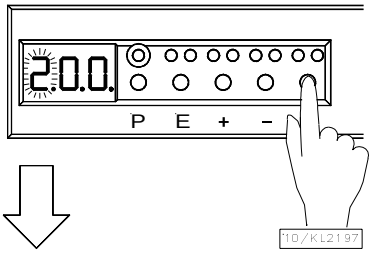
5.3 Parameter Selection

5.3.1 Direct Selection

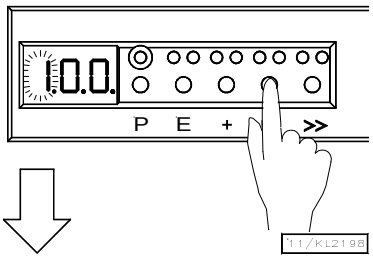
1. After code number input at the programming level



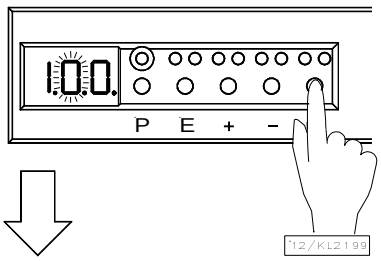
2. Press the >> key (first digit blinks)



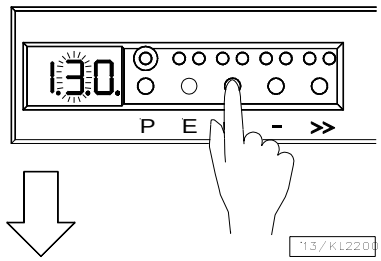
3. Press the + or – key to select the first digit



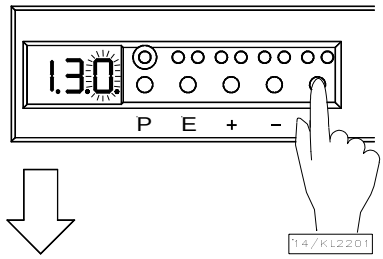
4. Press the >> key (second digit blinks)



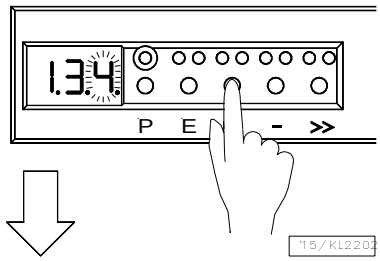
5. Press the + or – key to select the second digit



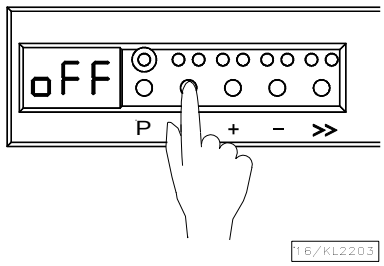
6. Press the >> key (third digit blinks)



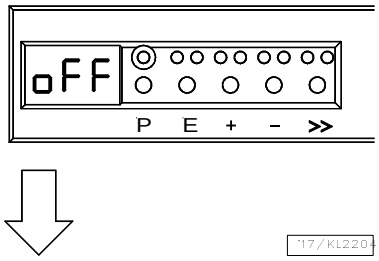
7. Press the + or – key to select the third digit



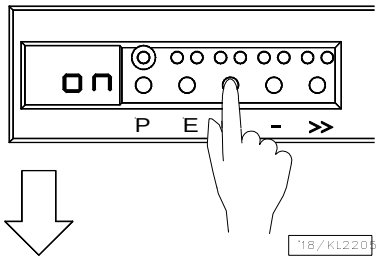
8. Press the **E** key; the parameter value is displayed. There are no points between the digits.



5.3.2 Changing Parameter Values



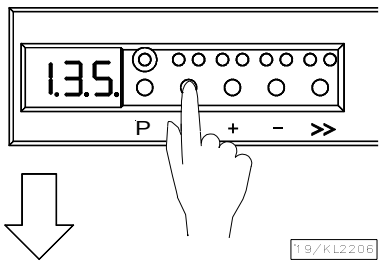
Display after parameter value selection



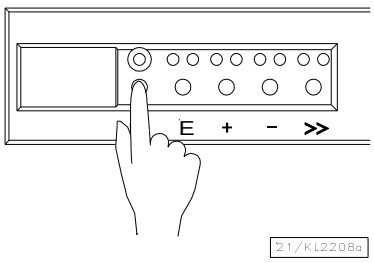
Change the parameter value by pressing the + or – key

Option 1:

Press the **E** key. The next parameter number is displayed.

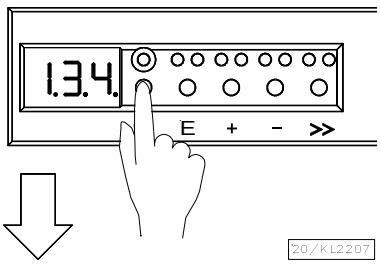


Press the **P** key. Exit programming.
The changed parameter values will be saved when you start sewing again!

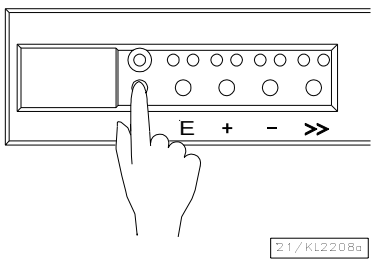


Option 2:

Press the **P** key. The same parameter number is displayed.

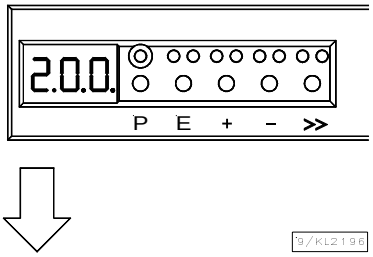


Press the **P** key. Exit programming.
The changed parameter values will be saved when you start sewing again!

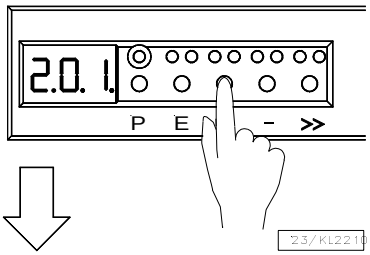


5.3.3 Parameter Selection with the +/- Keys

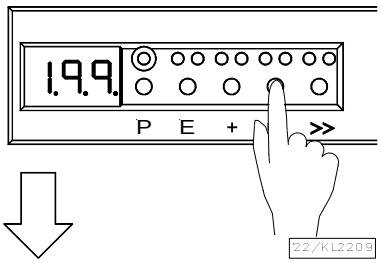
1. After code number input at the programming level



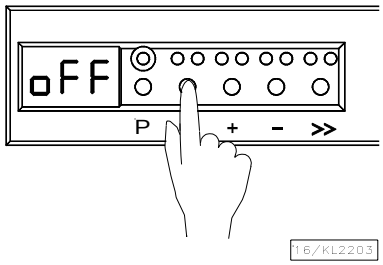
2. Select the next parameter by pressing the + key



3. Select the previous parameter by pressing the - key



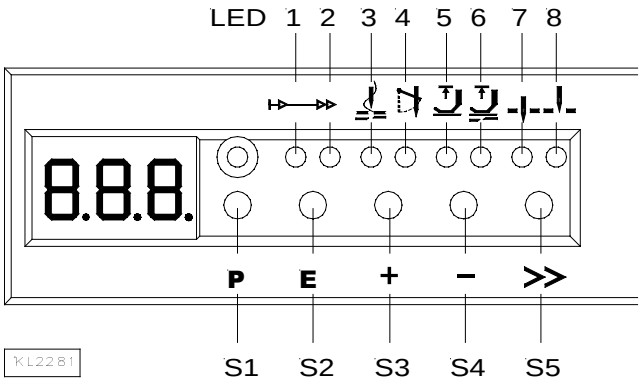
4. After pressing the **E** key, the parameter value is displayed



5.4 Changing All Parameter Values at the Operator Level

All parameter values at the operator level can be changed without code number input (see List of Parameters).

- Press the **P** key ➔ The first parameter number will be displayed.
- Press the **E** key ➔ The parameter value will be displayed.
- Press the +/- keys ➔ The parameter value will be changed.
- Press the **E** key ➔ The next parameter will be displayed.
- Press the **E** key ➔ The parameter value will be displayed.
- Press the +/- keys ➔ The parameter value will be changed.
  etc.
- Press the **P** key twice ➔ Exit programming at the operator level



5.5 Function Switchover

Switchable functions can be changed by pressing the appropriate key. The switching state is indicated by light emjtting diodes (LED). See above illustration!

Table: Assignment of functions to keys and LEDs

Function	Key		LED number	
Softstart On	**E**	(S2)	1 = on	2 = off
Softstart Off	**E**		1 = off	2 = off
Thread trimmer On (in all modes except mode 7, 11 and 12)	**+**	(S3)	3 = on	4 = off
Thread trimmer On	**+**		3 = off	4 = on
Thread trimmer and thread wiper On	**+**		3 = on	4 = on
Thread trimmer and thread wiper Off	**+**		3 = off	4 = off
Tape cutter at the start of the seam (mode 7)	**+**	(S3)	3 = on	4 = off
Tape cutter at the seam end On	**+**		3 = off	4 = on
Tape cutter at the start of the seam and at the seam end On	**+**		3 = on	4 = on
Tape cutter at the start of the seam and at the seam end Off	**+**		3 = off	4 = off
Sewing foot lift at stop in the seam (automatic)	**-**	(S4)	5 = on	6 = off
Sewing foot lift at the seam end (automatic)	**-**		5 = off	6 = on
Sewing foot lift at stop in the seam and at the seam end (automatic)	**-**		5 = on	6 = on
Sewing foot lift (automatic) Off	**-**		5 = off	6 = off
Basic position down (position 1)	**>>**	(S5)	7 = on	8 = off
Basic position up (position 2)	**>>**		7 = off	8 = on

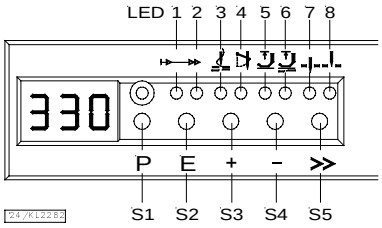
5.6 Direct Input of Maximum Speed Limitation

The maximum speed of the machine must be limited to the specific level according to the application. Do the setting at the operator level on the control by means of the +/- keys during operation or at intermediate machine stop. This function is blocked at the start of the seam or after the seam end. The actual value shown on the display must be multiplied by 10.

Example:

The value 330 on the control display corresponds to a speed of 3300 RPM.

Important! If the speed is changed, it is saved only after trimming and when you start sewing again.



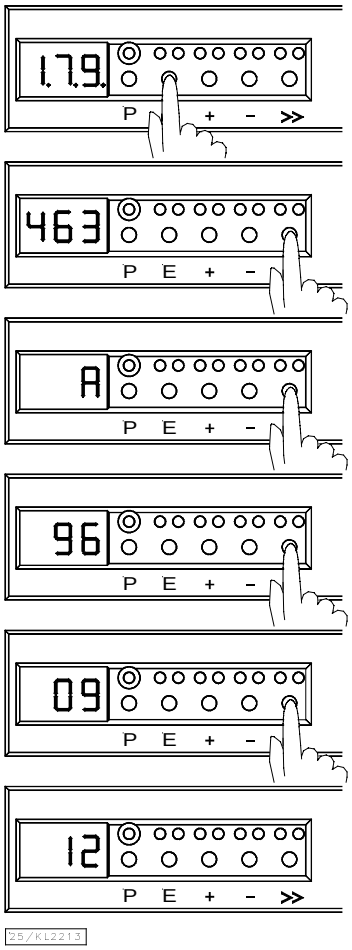
5.7 Program Identification on the Control

Functions	Parameter
Program number, modification index and identification number display	**179**

After having selected parameter 179 **(example)**, the following information is displayed in succession:

Example:

- Select parameter **179** and press the **E** key!
- The display shows the program number (1463) shortened by one digit! Continue by pressing the >> key!
- The display shows the program modification index (A)! Continue by pressing the >> key!
- Identification number digit 1 and 2! Continue by pressing the >> key!
- Identification number digit 3 and 4! Continue by pressing the >> key!
- Identification number digit 5 and 6!



The routine is repeated after pressing the **E** key. Exit the routine after pressing the **P** key once. The next parameter number is displayed. Exit programming after pressing the **P** key. The drive is again ready for sewing.

6 Putting into Service

Before putting the control into service, the following must be ensured, checked and/or adjusted:

- **The correct installation of the drive, position transmitter and accompanying devices, if necessary**
- **The correct selection of the trimming operation by means of parameter 290**
- **If necessary, the correct adjustment of the direction of motor rotation by means of parameter 161**
- **The correct selection of the functions of the keys (inputs) by means of parameters 240/242/243**
- **The correct positioning speed by means of parameter 110**
- **The correct maximum speed compatible with the sewing machine by means of parameter 111**
- **The setting of the remaining relevant parameters**
- **Start sewing in order to save the set values**

7 Setting the Basic Functions

7.1 Direction of Motor Rotation

Function **with** or **without** control panel		Parameter
Direction of motor rotation	(drE)	**161**

Parameter 161 = 0 Clockwise motor rotation (look at the motor shaft)
Parameter 161 = 1 Counterclockwise motor rotation

ATTENTION
If the motor is mounted differently, e. g. at a different angle or with gear, make sure that the value set by means of parameter 161 corresponds to the direction of rotation.

7.2 Selection of Functional Sequences (Thread Trimming Operations)

Lockstitch, chainstitch and overlock machines with different functional sequences can be operated using this control. The functional sequences can be selected by means of parameter 290.

ATTENTION
Before switching functional sequences, detach cables from the inputs and outputs! Please ensure that the machine installed provides the functional sequence to be set!
Settings with parameter 290 only after power On!

Setting the functional sequence using parameter 290

Mode	Designation	Adapter	Outputs					Inputs		
	Power transistors →		**FL** ST2/35	**M1** ST2/37	**M2** ST2/28	**M3** ST2/27	**ML** ST2/32	**in1** ST2/7	**in3** ST2/6	**in4** ST2/8
0	**Lockstitch; e. g.**									
	Brother (737-113, 737-913)	1112814	FL	FA1 +	FA2	FW	-	-	NHT	-
	Aisin (AD3XX, AD158, 3310; EK1)	1112815	FL	FA1 +	FA2	FW	-	-	NHT	-
	Pfaff (563, 953, 1050, 1180)	1112841	FL	FA1	FA2	FW	ML	-	-	FLEX
	Dürkopp Adler (210, 270)	1112845	FL	FA1 +	FA2	FW	-	-	NHT	EST
1	**Lockstitch; e. g.** Singer (591, 211U, 212U)	1112824	FL	-	FA2	FW	-	NHT	-	-
2	**Lockstitch; e. g.** Singer (212 UTT)	1112824	FL	-	FA	FSPL	-	NHT	-	-
3	**Lockstitch;** e. g. Dürkopp Adler (467)		FL	FA	FSPL	FW	ML	NHT	-	-
4	**Chainstitch;** Union Special									
	(34000 and 36200 replacement for US80A)	1112865	FL	-	FA-V	FW	ML	LSP	LSP	ENTK
	(CS100 and FS100)	1112905	FL	-	FA-V	FW	ML	LSP	LSP	-
5	**Chainstitch; parallel sequence**									
	Yamato (VC series)	1112818	FL	FA	-	FW	-	LSP	-	-
	Yamato (VG series)	1113178	FL	FA	-	FW	-	LSP	-	-
	Kansai (RX 9803)	1113130	FL	FA	-	FW	ML	LSP	-	-
	Pegasus (W500/UT)	1112821	FL	FA	FA	FW	-	LSP	-	-
	Brother (FD3-B257)	1112822	FL	FA	FA	FW	-	LSP	ENTK	-
	Global (CB2803-56)	1112866	FL	-	-	FA	-	LSP	-	-
	Rimoldi (F27)	1113096	FL	FW	FAO	FAU	ML	-	-	-
6	**Chainstitch;** tape cutter/fast scissors		FL	M1	AH1	AH2	ML	-	-	-
7	**Overlock**		FL	M1	M2	AH	ML	-	-	-
8	**Backlatch;** Pegasus	1113234	-	PD≤-1	PD≥1	-	-	LSP	N.AUTO	-
9	**Backlatch;**Yamato (ABT3)	1112826	-	PD≤-1	PD≥1	-	-	LSP	N.AUTO	-
	Backlatch;Yamato (ABT13, ABT17)	1113205	-	PD≤-1	PD≥1	-	-	LSP	N12.AU	N9.AU
10	**Lockstitch; e. g.** Union Special (63900AMZ replacement for US80A)	1113199	FL	-	FA-V	FW	ML	-	-	-
11	**Reversal of motor rotation with pedal in pos.–2**		FL	DR-UK	PD=-2	ML	ML	N.POS	-	-
12	**Reversal of motor rotation with input in3**		FL	DR-UK	PD=0	ML	ML	N.POS	DR-UK	-
13	**Lockstitch;** Pfaff (1425)	1113072	FL	FA	FSPL	FW	ML	NH	POS2	DB
14	**Lockstitch; e. g.**									
	Juki (5550-6)	1112816	FL	FA1+2	-	FW	-	-	-	-
	Juki (5550-7)	1113132	FL	FA1+2	FZ	FW	-	-	-	-
17	**Chainstitch;** Pegasus		FL	M1	M2	M3	ML	-	-	-
18	**Overlock;** Bottoms		FL	M1	AH	M3	ML	-	-	-
19	**Lockstitch;** Macofrey		FL	FA-R	FA-V	FW	ML	-	-	-
20	**Lockstitch;** Juki (LU1510-7)	1113200	FL	FA	FSPL	-	-	-	BIT0	BIT1
22	**Lockstitch;** Brother (B-891)		FL	FA	FSPL	FW	ML	-	-	-

See the following page for letter symbols of the solenoid outputs!

Explanation of letter symbols of the previous page!

Outputs:

FL	= Sewing foot lifting
FA1	= Thread trimmer pos. 1...1A
FA2	= Thread trimmer pos. 1A...2
FA1+2	= Thread trimmer pos. 1...2
FSPL	= Thread tension release
FA-R/FA-V	= Thread trimmer backward/forward
ML	= Machine running
FW	= Thread wiper
AH/AH1/AH2	= Tape cutter / Tape cutter 1/ Tape cutter 2
DR-UK	= Reversal of motor rotation
PD=0	= Pedal step 0
PD-2	= Pedal step -2
FAO	= Needle thread trimmer
FAU	= Bobbin thread trimmer
FZ	= Thread puller
PD≥1	= Pedal steps 1...12
PD≤-1	= Pedal steps –1 / -2

Inputs:

NHT	= Needle up/down
EST	= Single stitch
FLEX	= External sewing foot lifting
N.POS	= Positioning speed
N.AUTO	= Automatic speed
N9.AU	= Automatic speed n9
N12.AU	= Automatic speed n12
LSP	= Machine run blockage
DR-UK	= Reversal of motor rotation
NH	= Needle up
POS2	= Run to position 2
DB	= Speed limitation n12
ENTK	= Unlocking the chain
BIT0	= Speed limitation bit 0
BIT1	= Speed limitation bit 1

Mode 0 Lockstitch Machines
- Thread trimmer from leading to trailing edge of slot position 1
- Thread trimmer from trailing edge of slot position 1 to leading edge of slot position 2
- Thread wiper for a programmable time (t6)
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”
- High lift for walking foot/flip-flop at limited speed after pressing the key

Mode 1 Lockstitch Machines (Singer 591, 211U, 212U)
- Thread trimmer from trailing edge of slot position 1 to leading edge of slot position 2
- Drive stops at the trailing edge of slot position 2
- Thread wiper for a programmable time (t6)
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”

Mode 2 Lockstitch Machines (Singer 212 UTT)
- Thread trimmer for a programmable time (kt2) after intermediate stop in position 1
- Thread trimmer from leading edge of slot position 1 to leading edge of slot position 2
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”

Mode 3 Lockstitch Machines with Thread Trimming System (e. g. Dürkopp Adler)
- Thread trimmer for a programmable time (tFA) and for programmable increments (iFA) after intermediate stop in position 1
- Thread tension release from start in position 1 after delay (FSE) during ON period (FSA)
- Thread wiper for a programmable time (t6)
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”

Mode 4 Chainstitch Machines (Union Special)
- Thread trimmer forward after stop in position 2 after delay (kd2) during ON period (kt2)
- Thread trimmer backward after stop in position 2 after delay (kd1) during ON period (kt1)
- Thread wiper after stop in position 2 after delay (kd3) during ON period (kt3)
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”

Mode 5 Chainstitch Machines In General
- Signal “machine running”

196 = 0 Signal M1 after stop in position 2 after delay (kd1) during ON period (kt1)
- Signal M2 after stop in position 2 after delay (kd2) during ON period (kt2)
- Signal M3 after stop in position 2 after delay (kd3) during ON period (kt3)
- Time-delayed (kdF) sewing foot lifting after standstill in position 2 (see chapter "Sewing Foot Lifting")

196 = 1 Signal M1 after seam end in position 2 after delay (kd1) during ON period (kt1)
- Signal M2 after seam end in position 2 after delay (kd2) during ON period (kt2)
- Signal M3 after seam end in position 2 after delay (kd3) during ON period (kt3) and one more machine rotation. After that the M3 signal turns off (see timing diagram).

- Time-delayed (kdF) sewing foot lifting after the last signal has turned off

273 = ON Signal M1 after stop in position 2 after delay (kd1) during ON period (kt1)
- Signal M2 after stop in position 2 after delay (Ad2) during ON period (At2) and after stop in position 2 after delay (kd2) during ON period (kt2)
- Signal M3 at the start of the seam after delay (Ad1) during ON period (At1)
- Signal M5 (ML) at the start of the seam after delay (Ad3) during ON period (At3). No machine running signal (see timing diagrams)
- Time-delayed (kdF) sewing foot lifting after standstill in position 2 (see chapter "Sewing Foot Lifting")

Mode 6 Chainstitch Machines with Tape Cutter or Fast Scissors
- Signal M1 after stop in position 2 after delay (kd1) during ON period (kt1)
- Signal M2 after stop in position 2 after delay (kd2) during ON period (kt2) or if parameter 232 = ON, as **fast scissors** alternating with M3.
- Signal M3 after stop in position 2 after delay (kd3) during ON period (kt3) or if parameter 232 = ON, as **fast scissors** alternating with M2.
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”

Mode 7 Overlock Machines
- Signal M1 after stop in position 2 after delay (kd1) during ON period (kt1)
- Signal M2 after stop in position 2 after delay (kd2) during ON period (kt2) or if parameter 232=ON, as **fast scissors** alternating with M3 **(parameter 282=0)**
- Tape cutter at the start of the seam after stitch count (c3) and at the seam end after stitch count (c4)
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”

Mode 8 Backlatch Machines (Pegasus)
- Signal M1 with pedal in positions -1 and –2
- Signal M2 with pedal in positions 1-12
- Inverted signal M3 with pedal in positions 1-12
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”
- Machine run blockage effective with open contact **(input in1 / parameter 240=6)** Automatic speed has priority over machine run blockage
- Key for operation at automatic speed **(input in3 / parameter 242=10)**

Mode 9 Backlatch Machines (Yamato)
- Signal M1 with pedal in positions -1 and –2
- Signal M2 with pedal in positions 1-12
- Inverted signal M3 with pedal in positions 1-12
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”
- Key for operation at automatic speed n12 **(input in3 / parameter 242=10)**
- Machine run blockage effective with open contact **(input in1 / parameter 240=6)**
- Machine run blockage has priority over automatic speed n12
- Key for operation at automatic speed n9 **(input in4 / parameter 243=34)**
- Automatic speed n9 has priority over machine run blockage

Mode 10 Lockstitch Machines (Refrey Trimmer)
- Thread trimmer forward from trailing edge of slot position 1 to leading edge of slot position 2
- Thread trimmer backward with full power for the time (kt1) ; after that the signal is pulsed.
- Thread wiper (M3) after stop in position 2 after delay (kd3) during ON period (kt3)
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”

Mode 11 Reversal of motor rotation with pedal in pos. -2
- Signal M1 direction of rotation
- Signal M2 pedal = -2
- Signal “machine running”
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Key for operation at positioning speed **(input in1 / parameter 240=20)**

Mode 12 Reversal of motor rotation with input in3
- Signal M1 direction of rotation
- Signal M2 pedal = 0
- Signal “machine running”
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Key for operation at positioning speed **(input in1 / parameter 240=20)**
- Key for reversal of motor rotation **(input in3 / parameter 240=21)**

Mode 13 Lockstitch Machines with Thread Trimming System (Pfaff 1425)
- Thread trimmer for programmable increments (iFA) after intermediate stop in position 1
- Thread tension release from leading edge of slot position 1 after delay (FSE) during ON period (FSA)
- Thread wiper for a programmable time (t6)
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”
- Key for function "needle up" **(input in1 / parameter 240=2)**
- Key for run to position 2 **(input in3 / parameter 242=24)**
- Key for speed limitation (n12) **(input in4 / parameter 243=11)**

Mode 14 Lockstitch Machines (Juki 5550-6, 5550-7)
- Thread trimmer (M1) from trailing edge of slot position 1 to leading edge of slot position 2
- Signal (M2) after stop in position 2 after delay (kd4) during ON period (kt4)
- Thread wiper (M3) for a programmable time (t6)
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”

Mode 17 Chainstitch Machines (Pegasus Stitch Lock)
- Thread trimmer (FA) after stop depending on angle after delay (kd2) during ON period (kt2)
- Stitch lock signal (STS) after intermediate stop in position 2 after delay (kd3) during ON period (kt3) and after stop depending on angle
- Top cover thread cutter (LFA) after stop depending on angle after delay (kd1) during ON period (kt1)
- Time-delayed (kdF) sewing foot lifting after standstill in position 2 (see chapter "Sewing Foot Lifting")
- Signal “machine running”

Mode 18 Overlock Machines (Bottoms Overlock)
- Tape cutter during stitch count (c1) at the start of the seam and during stitch count (c2) at the seam end
- Signal M1 after light barrier compensating stitches and during stitch count(c4)
- Signal M3 after light barrier covered
- Time-delayed (kdF) sewing foot lifting
- Signal “machine running”

Mode 19 Lockstitch Machines (Macofrey) Functions as in mode 10!

Mode 20 Lockstitch Machines (Juki LU1510-7)
- Thread trimmer (FA) for programmable increments (iFA) from position 1 onwards
- Thread tension release from leading edge of slot position 1 after delay (FSE) during ON period (FSA)
- Thread wiper from stop in position 2 onwards after delay (kd3) during ON period (kt3)
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”

Mode 22 Lockstitch Machines (Brother B-891)
- Thread trimmer for programmable increments (iFA) after intermediate stop in position 1
- Thread tension release from trailing edge of slot position 2 after delay (FSE) during ON period (FSA)
- Thread wiper for a programmable time (t6)
- Sewing foot lifting (see chapter "Sewing Foot Lifting")
- Signal “machine running”

See List of Parameters chapter "Timing Diagrams" for the various modes!

7.3 Functions of the Keys Inputs in1, in3 and in4

Functions				Parameter
Input 1	selectable input functions	0...44	in1	**240**
Input 3	“ “	0...44	in3	**242**
Input 4	“ “	0...44	in4	**243**
Software debouncing of all inputs On/Off				**238**

See List of Parameters for possible input functions of the keys.

7.4 Positioning Speed

Functions		Parameter
Positioning speed	n1	**110**

The positioning speed can be set by means of parameter 110 on the control within a range of 70...390 RPM.

7.5 Maximum Speed Compatible with the Sewing Machine

The maximum speed of the machine is determined by the selected pulley and by the following settings:
- Set the maximum speed using parameter 111 (n2)
- Set the maximum speed limitation to the specific level according to the application as described in chapter "Direct Input of Maximum Speed Limitation (DED)".

7.6 Maximum Speed

Functions		Parameter
Maximum speed	n2	**111**

Note
See instruction manual of the sewing machine manufacturer for the maximum speed of the sewing machine.

Note
Select the pulley such that the motor runs at approx. 4000 RPM with max. number of stitches.

When programming 3-digit or 4-digit parameter values on the control (without control panel), the 2-digit or 3-digit values displayed must be multiplied by 10.

7.7 Positions

Before setting the position transmitter ensure that the direction of motor shaft rotation is set correctly!

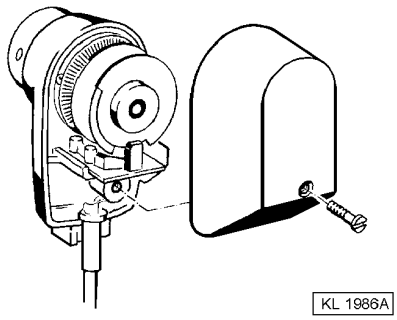
CAUTION!
If the motor is mounted differently, e. g. at a different angle or with gear, make sure that the direction of rotation is correct. Reset the positions if necessary.

CAUTION!
Turn power off before adjusting the positioning discs.

CAUTION!
Be very careful when adjusting the positioning discs.
Risk of injury!
Please ensure that positioning discs and generator disc (inner disc) are not damaged.

The positions are set as follows:

- Remove position transmitter cover after loosening the screw.
- Select basic position **needle down** (LED 7 on the control lights up) by means of the S5 key.
- Adjust central disc for position 1 to the desired direction.
- Press the pedal briefly forward.
- Check the stop position.
- Heelback (trimming).
- Select basic position **needle up** (LED 8 on the control lights up) by means of the S5 key.
- Adjust outer disc for position 2 to the desired direction.
- Press the pedal briefly forward.
- Check the stop position.
- Repeat procedure if necessary.
- Select the desired basic position by means of the S5 key.



- Put cover on again and tighten screw.

Note
For functional sequences that are controlled by the slot width, set slot width if necessary according to the above. Initiate the desired functional sequence in order to check the setting. The opening angle of position transmitters with adjustable slot width must not be below 20°.

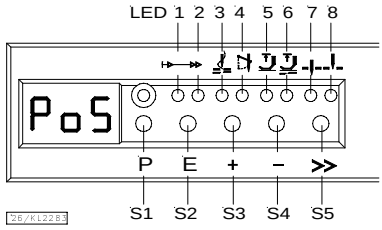
Note
To ensure a correct trimming operation the positions 1 and 2 must not overlap.

7.8 Display of the Signal and Stop Positions

Functions	Parameter
Display of positions 1 and 2	1**72**

The position settings can easily be checked by means of parameter 172.

- Select parameter 172
- The control display shows "PoS"
- Turn handwheel according to the direction of motor rotation



Control display
- LED 7 on corresponds to position 1
- LED 7 turns off corresponds to position 1A
- LED 8 on corresponds to position 2
- LED 8 turns off corresponds to position 2A

7.9 Braking Characteristics

Functions	Parameter
Braking effect when varying the preset value ≤ 4 stages Braking effect when varying the preset value ≥ 5 stages	**207** **208**

- Parameter 207 regulates the braking effect between speed stages
- Parameter 208 influences the braking effect for the stop

The following applies to all setting values:
The higher the value, the stronger the braking reaction!

7.10 Braking Power at Standstill

Functions	Parameter
Braking power at standstill	**153**

This function prevents unintentional "wandering" of the needle at standstill.
The effect can be checked by turning the handwheel.

- The braking power is effective at standstill
  - at stop in the seam
  – after the seam end
- The effect can be set

- The higher the set value, the stronger the braking power

7.11 Starting Characteristics

Functions	Parameter
Starting edge	**220**

The drive acceleration dynamics can be adapted to the sewing machine characteristic (light/heavy).

- High setting value = high acceleration

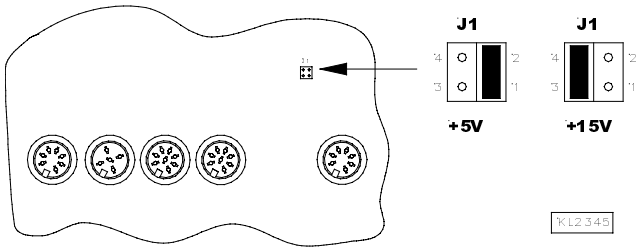
With a high starting edge setting and, in addition, possibly high braking parameter values on a light machine, the characteristic may appear coarse. In this case, one should try to optimize the settings.

7.12 Supply Voltage 5V or 15V

CAUTION!
Turn power off before opening the control box!

There is a supply voltage of +5V on socket B18/6 for external devices. After opening the cover, this voltage can be changed to +15V by replugging a multipole connector J1 on the printed circuit board.

+5V = Connect righthand pins 1 and 2 with jumper (factory setting)
+15V = Connect lefthand pins 3 and 4 with jumper



8 Functions

8.1 First Stitch after Power On

Functions	Parameter
1 stitch at positioning speed after power on	**231**

If parameter 231 is on, the first stitch after power on will be performed at position speed for the protection of the sewing machine. This is independent of the pedal position and the softstart function.

8.2 Softstart

Functions	Parameter
Softstart On/Off	**134**

Functions:
- after power on
- at the beginning of a new seam
- speed pedal controlled and limited to (n6)
- lower speed of a parallel function prevailing (e. g. start backtack, stitch counting)
- stitch counting synchronized to position 1
- suspension with pedal in position 0 (neutral)
- interruption by full heelback (position -2)

8.2.1 Softstart Speed

Functions		Parameter
Softstart speed	n6	**115**

When programming 3-digit or 4-digit parameter values on the control, the 2-digit or 3-digit values displayed must be multiplied by 10.

8.2.2 Softstart Stitches

Functions		Parameter
Number of softstart stitches	SSc	**100**

8.3 Sewing Foot Lifting

Functions		Control
Automatic in the seam	lefthand LED above key On	S4 key
Automatic after thread trimming	righthand LED above key On	S4 key

Functions		Parameter
Automatic sewing foot with pedal forward at the seam end if light barrier or stitch counting is on		**023**
Thread tension release with sewing foot at the seam end or at intermediate stop and at the seam end (effective only in mode 13)		**024**
Switch-on delay with pedal in position –1 (half heelback)	t2	**201**
Start delay after switching off the sewing foot lift signal	t3	**202**
Time of full power	t4	**203**
Duty ratio (ED) with pulsing	t5	**204**
Delay after thread wiping until sewing foot lifting	t7	**206**
Delay after thread trimming without thread wiper until sewing foot lifting	tFL	**211**
Selection of the sewing foot lift function		**236**

Sewing foot is lifted:

- in the seam
  - by half heelback (position -1)
  - or automatically (by means of the **S4** key on the control, lefthand LED lights up)
  - by pressing a key depending on the preselection of parameters 240/242/243
- after thread trimming
  - by heelback (position -1 or -2)
  - or automatically (by means of the **S4** key on the control, righthand LED lights up)
  - by pressing a key depending on the preselection of parameters 240/242/243
  - automatically by means of light barrier with pedal forward according to the setting of parameter 023
  - automatically by means of stitch counting with pedal forward according to the setting of parameter 023
  - switch-on delay after thread wiper (t7)
  - switch-on delay without thread wiper (tFL)

It is possible to prevent unintentional foot lifting before thread trimming when changing from pedal position 0 (neutral) to position -2 by setting a switch-on delay (t2) by means of parameter 201.

Holding power of the lifted foot:

The sewing foot is lifted by full power. Then the system switches automatically to partial power in order to reduce the load for the control and the connected solenoid.

Set the duration of full power by means of parameter 203 and the partial holding power by means of parameter 204.

CAUTION!

If the holding power is set too high, the solenoid and the control may be permanently damaged. Please observe the permissible duty ratio (ED) of the solenoid, and set the appropriate value according to the table below.

Stage	Duty ratio (ED)	Effect
1	12.5 %	low holding power
2	25.0 %	
3	37.5%	
4	50.0%	
5	62.5%	
6	75.0%	
7	87.5%	
0	100.0%	high holding power (full power)

Sewing foot lowers:

- Press pedal to position 0 (neutral)
- Press pedal to position ½ (slightly forward)
- Release key for manual sewing foot lift

Upon pressing the pedal forward from lifted sewing foot, the start delay (t3) that can be set by means of parameter 202 becomes effective.

The following settings are possible with parameter 236:

Parameter 236 = 0 Sewing foot lifting is possible from all positions.

Parameter 236 = 1 Sewing foot lifting is possible only from position 2.

Parameter 236 = 2 Sewing foot lifting is stored in pedal position –1 or –2. The storing can be undone by pressing the pedal slightly forward.

See List of Parameters chapter **"Timing Diagrams"!**

8.4 Intermediate Backtack

Functions	Parameter
Backtacking signal at output M1, M2 or M3 On/Off	**148**

148 = 0 Backtacking signal Off
148 = 1 Backtacking signal effective at output M1.
148 = 2 Backtacking signal effective at output M2
148 = 3 Backtacking signal effective at output M3. If parameter 148 is set to "3", parameter 297 is automatically set to "0". If this setting is changed to "1...4", parameter 148 is also automatically set to "0". The function of the parameter that was last changed is taken into account.

A **backtacking** signal can be programmed to one of the three outputs M1, M2 or M3 by means of parameter 148. It can be activated anywhere in the seam or at standstill by pressing the key assigned to the function according to the selection of one of the parameters 240/242/243.
If parameter 148 is set to "0", the relevant output is reset to the function provided in the selected mode. See List of Parameters chapter "Connection Diagram"!

ATTENTION!
Before changing this parameter, please ensure that the machine installed provides the set function. Otherwise the machine may be permanently damaged!

8.5 Signal "Machine Running"

Functions		Parameter
Machine running signal at output M1, M2 or M3 On/Off		**147**
Mode **machine running**	(LSG)	**155**
Switch-off delay for **machine running** signal	(t05)	**156**

147 = 0 **Machine running** signal Off
147 = 1 **Machine running** signal effective at output M1.
147 = 2 **Machine running** signal effective at output M2
147= 3 **Machine running** signal effective at output M3. If parameter 147 is set to "3", parameter 297 is automatically set to "0". If this setting is changed to "1...4", parameter 147 is also automatically set to "0". The function of the parameter that was last changed is taken into account.

A **machine running** signal can be programmed to one of the three outputs M1, M2 or M3 by means of parameter 147. The original function of the relevant output is suppressed. If parameter 147 is set to "0", the output is reset to the function provided in the selected mode.
Furthermore, the **machine running** signal is permanently activated on socket ST2/32, except if parameter **290 = 5 and 273 = ON or 297 = 4**. In this case the output is assigned for different signals.

Parameter 155 = 0 **Machine running** signal Off.
Parameter 155 = 1 **Machine running** signal will be issued whenever the drive is running.
Parameter 155 = 2 **Machine running** signal will be issued whenever the speed is higher than 3000 RPM.
Parameter 155 = 3 **Machine running** signal will be issued whenever the pedal is not in position 0 (neutral).

The signal switch-off time can be delayed by means of parameter 156.

See List of Parameters chapter Connection Diagram!

ATTENTION!
Before changing this parameter, please ensure that the machine installed provides the set function. Otherwise the machine may be permanently damaged!

8.6 Reverse Motor Rotation

Functions		Parameter
Positioning speed	n1	**110**
Number of reversing increments	ird	**180**
Switch-on delay of reverse motor rotation	drd	**181**
Reverse motor rotation On/Off		**182**

The function **reverse motor rotation** is performed after trimming. When the stop position is reached, the drive stops for the duration of the switch-on delay of reverse motor rotation. Then it runs in reverse direction at positoioning speed for a number of increments that can be set. 1 increment corresponds to approx. 3°.

8.7 Unlocking the Chain (Mode 4/5/6/7/)

Functions		Parameter
Number of run-out stitches when unlocking the chain (effective only if parameter 190 = 3)	c6	**184**
Function “unlock the chain” in modes 4, 5, 6 and 7		**190**

Upon unlocking the chain at the seam end, the functions **thread trimming** and **tape cutter/fast scissors** are automatically suppressed. The drive stops in position 1 if parameter 180 = >0. If parameter 180 = 0, the drive stops in the selected basic position. With this setting (only mode 7), reverse motor rotation is blocked and the function **tape cutter/fast scissors** is possible if parameter 190 is set to “3”. Moreover, the run-out stitches (parameter 184) and the function “blow fabric onto stack” are performed on output M1.

Settings necessary for the operation “unlocking the chain”:
- Set “unlocking the chain” by means of parameter 190 = 1 / 2 / 3 (190 = 0 “unlocking the chain” off)
- Switch the reverse motor rotation on by means of parameter 182.
- Set **switch-on delay** by means of parameter 181 and **reversing angle** by means of parameter 180
- Determine the **function of the key “unlocking the chain”** by setting one of the parameters 240, 242 or 243 to “18”.

Parameter 190 = 0: Unlocking the chain Off

Parameter 190 = 1: Sequence with pedal in position -2 from machine run or from position 2:
- Press key "unlocking the chain"
- Run at positioning speed to position 1
- Sequence of reversing angle at positioning speed after a switch-on delay that can be set

Parameter190 = 1: Sequence with pedal in position -2 from standstill in position 1:
- Press key "unlocking the chain"
- Sequence of reversing angle at positioning speed after a switch-on delay that can be set

Parameter 190 = 2: Automatic sequence with light barrier at the seam end without tape cutting / pedal in position -2 according to the setting of parameter 019:
- Press key "unlock the chain"
- Run to position 1 after light barrier sensing
- Sequence of reversing angle at positioning speed after a switch-on delay that can be set

Parameter 190 = 3 Automatic sequence with light barrier at the seam end with tape cutting and run-out stitches (only possible in mode 7):
- Press key "unlocking the chain"
- After light barrier sensing, execution of compensating stitches and end counting until tape cutting
- Run-out stitches until unlocking the chain can be set by means of parameter 184
- After the machine has stopped, the motor does not run in reverse direction, but the signal M1 “blow fabric onto stack” will be issued, unless parameters 146, 147, 148 have not been set differently.

Furthermore, one of parameters 240, 242 or 243 can be set to “27“. This way, “**unlocking the chain**” can be performed in any seam section whenever the external key is pressed. But the process cannot be repeated in the same seam section.

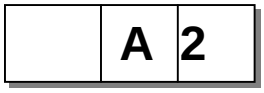
See timing diagrams in the List of Parameters for operation characteristics of the control.

8.8 Machine Run Blockage (Safety Switch)

CAUTION!
This is not a safety function. The line voltage must still be switched off during maintenance and repair work.

The function “machine run blockage” is enabled by connecting a switch to socket ST2 or B4, depending on the preselection of parameters 240/242/243.

Display after enabling machine run blockage:

Control display ➔ 

Machine run blockage in the free seam, seam with stitch counting and light barrier seam:
The seam is suspended by opening and/or closing the switch.
- Stop in the basic position
- Needle up is not possible
- Sewing foot lift is possible

New start after machine run blockage

Functions	Parameter
New start after machine run blockage	**234**

Parameter 234 determines how a new start is possible after closing and/or opening the switch.
Parameter 234 = OFF New start after disabling machine run blockage without influence by the pedal. This setting is applicable, for example, to automats.
Parameter 234 = ON New start after disabling machine run blockage only if the pedal is in position 0 (neutral).

8.9 High Lift for Walking Foot / Flip-Flop 1

Functions	Parameter
High lift for walking foot On/Off Signal “high lift for walking foot” is issued with closed or open contact	**137** **263**

8.9.1 Signal “High Lift for Walking Foot”

Functions	Parameter
Signal **high lift for walking foot** at output M1, M2 or M3 On/Off	**146**

146 = 0 Signal **high lift for walking foot** Off
146 = 1 Signal **high lift for walking foot** effective at output M1.
146 = 2 Signal **high lift for walking foot** effective at output M2
146 = 3 Signal **high lift for walking foot** effective at output M3. If parameter 146 is set to “3“, parameter 297 is automatically set to “0“. If this setting is changed to “1...4“, parameter 146 is also automatically set to “0“. The function of the parameter that was last changed is taken into account.

A signal **high lift for walking foot** can be programmed to one of the three outputs M1, M2 or M3 by means of parameter 146. It can be activated anywhere in the seam by pressing the key assigned to the function according to the selection of one of the parameters 240/242/243.
If parameter 146 is set to “0“, the relevant output is reset to the function provided in the selected mode. See List of Parameters chapter “Connection Diagram”!

ATTENTION!
Before changing this parameter, please ensure that the machine installed provides the set function. Otherwise the machine may be permanently damaged!

8.9.2 High Lift Walking Speed

Functions		Parameter
High lift walking speed	n10	**117**

8.9.3 High Lift Walking Speed Run-Out Time

Functions		Parameter
High lift walking speed run-out time	thP	**152**

8.9.4 High Lift Walking Stitches

Functions		Parameter
Number of high lift walking stitches	chP	**185**

Upon pressing the external key “high lift for walking foot” depending on the setting of parameters 240/242/243 and whether parameter 137 = ON, the speed is limited to high lift walking speed. The solenoid for high lift for walking foot is switched on if the speed ≤ high lift walking speed. It is possible to program run-out stitches by means of parameter 185. This way, high lift for walking foot remains on until stitch counting has been completed. The speed limitation remains effective during run-out time after the solenoid for high lift for walking foot has been switched off.

8.9.5 High Lift for Walking Foot Operational Mode Not Stored (Parameters 240/242/243 = 13)

The following function is performed if "0" run-out stitches have been programmed by means of parameter 185:
- Press key “high lift for walking foot”; signal “high lift for walking foot” is On.
- Release key“ high lift for walking foot”; signal “high lift for walking foot” turns off.

The following function is performed if ">0" run-out stitches have been programmed by means of parameter 185:
- When pressing key “high lift for walking foot” at drive standstill, signal “high lift for walking foot” is On and remains On after releasing the key.
- When pressing key “high lift for walking foot” again at drive standstill, signal “high lift for walking foot” turns off immediately.

If the signal “high lift for walking foot” is On when starting the drive, the speed will be limited. The signal turns off after the run-out stitches have been executed, and the speed limitation will be disabled after the run-out time (parameter 152).
If the key remains pressed down until after the count, high lift for walking foot remains on. If the key is pressed briefly, counting has priority.

While the drive is running, if ">0" run-out stitches have been programmed by means of parameter 185:
- Press key “high lift for walking foot” while drive is running; signal “high lift for walking foot” and high lift walking speed are On.
- Release key “high lift for walking foot” while drive is running; signal “high lift for walking foot” turns off, and the speed limitation will be disabled after the run-out time (parameter 152).

8.9.6 High Lift for Walking Foot Operational Mode Stored /Flip-Flop 1 (Parameters 240/242/243 = 14)

- When pressing key “high lift for walking foot” while drive is running, signal “high lift for walking foot” and high lift walking speed are On.
- When pressing key “high lift for walking foot” again while drive is running, signal “high lift for walking foot” turns off immediately, and the speed limitation will be disabled after the run-out time (parameter 152).

8.10 Speed Limitation n9

Functions		Parameter
Speed limitation n9	n9	**122**

If parameters 240/242/243 = 23, a speed limitation n9 will be switched on upon pressing an external key.

8.11 Disabling of Flip-Flop Functions at the Seam End

Functions	Parameter
Disabling of flip-flop functions at the seam end On/Off	**183**

Determine by means of parameter 183 whether the flip-flop signal shall be switched off at the seam end. If 183 = 0, the signal can be switched off only by means of the appropriate keys.
Parameter 183 = 0 The flip-flop 1 signal is not switched off at the seam end.
Parameter 183 = 1 The flip-flop 1 signal is switched off at the seam end.

8.12 Bobbin Thread Monitor

Functions	Parameter
Bobbin thread monitor 0 = Off / 1 = with stop / 2 = without stop / 3 = with stop and start blockage after thread trimming	**030**
Number of bobbin thread monitor stitches	**031**

For bobbin thread monitor operation a number of stitches depending on the length of the bobbin thread is preset by means of parameter 031. After the execution of these stitches the drive stops and a visual signal appears on the display. This means that the bobbin thread will run out. After pressing the pedal again, the seam can be continued and the thread can be trimmed. After inserting a full bobbin and pressing the ENTER key, a new sewing operation can be started.

Enable bobbin thread monitor:
- Set parameter 030 to "1...3".
- Input the desired maximum number of stitches in parameter 031 (input value x 100 = number of stitches, e. g. 80 x 100 = 8000).
- Determine an input for the functions of the key “start counter”.
- Start the sewing operation.

Bobbin thread monitor in operation:
- **Parameter 030 = 0:** Bobbin thread monitor is off.
- **Parameter 030 = 1:** The drive stops after the stitch counter has run out. The message "A7" appears on the control.
- **Parameter 030 = 2:** After the stitch counter has run out, the message "A7" appears on the control.
- **Parameter 030 = 3:** The drive stops after the stitch counter has run out. Thread trimming is possible with pedal in pos. –2. The start is blocked. The message "A7" appears on the control

Getting the bobbin thread monitor ready for operation:
- Insert a full bobbin.
- Press the selected external key.
- Set counting to the value determined by parameter 031 and start it.
- If the bobbin is changed before a message, the appropriate key must be pressed for at least 1 second in order to set the stitch counter to the default value.

8.13 Thread Trimming Operation

Functions	Parameter
Thread trimmer On/Off Thread wiper On/Off	**013** **014**

When thread trimming is off, the drive stops in position 2 at the seam end.

8.13.1 Thread Trimmer/Thread Wiper (Modes 0, 1, 2, 3, 10, 13, 14, 19, 20 and 22)

Functions		Parameter
Thread tension release with sewing foot lifting at the seam end or at intermediate stop and at the seam end (only in mode 13)		**024**
Switch signal M1 thread trimmer pos1...pos1A/pos1...pos2 (only in mode 0)		**145**
Thread trimming stop depending on angle (only in mode 20)	dr°	**197**
Thread wiper time	t6	**205**
Thread trimmer activation angle	iFA	**250**
Thread tension release switch-off delay	FSA	**251**
Thread tension release switch-on delay	FSE	**252**
Stop time for thread trimmer	tFA	**253**
Holding power output M1 of the thread trimmer backward	tAM	**254**

Thread trimming on lockstitch machines (modes 0...3, 10, 13, 14, 19, 20 and 22) is performed at trimming speed.
When thread trimming is off, the drive stops in position 2 at the seam end; it stops in position 1 at the end of programmed seams.
On lockstitch machines, the thread wiper ON period can be set depending on the selected trimming mode (see chapter "Timing Diagrams" in the List of Parameters). The return rime (t7) that can be set by means of parameter 206 prevents sewing foot lifting before the thread wiper is in its initial position. If the thread wiper is not connected, there will be a delay time (tFL) after thread trimming until sewing foot lifting.

The thread trimming signal M1 (only in mode 0) can be altered by means of parameter 145.
Parameter 145 = OFF Thread trimming signal M1 from position 1 to position 1A.
Parameter 145 = ON Thread trimming signal M1 from position 1 to position 2.

Thread tension release with sewing foot lifting, if parameter 290 = 13 and the thread trimmer is off.
Parameter 024 = 0 Thread tension release with sewing foot lifting only at the seam end.
Parameter 024 = 1 Thread tension release with sewing foot lifting at intermediate stop and at the seam end.

8.13.2 Trimming Speed

Functions		Parameter
Trimming speed	n7	**116**

8.13.3 Chainstitch Thread Trimmer (Modes 4, 5, 6 and 17)

Thread trimming on chainstitch machines (modes 4, 5, 6 and 17) is performed at machine standstill in position 2. When thread trimming is off, the drive stops in position 2 at the seam end.
The signal sequence of the thread trimmers and of the sewing foot can be set as desired by means of parameters 280...288 (parallel or sequential).

See timing diagrams in the List of Parameters for operation characteristics of the control. See also chapter "Selection of Functional Sequences (Thread Trimming Operations)".

8.13.4 Chainstitch Machine Trimming Signal Times

Signal delay times and ON periods can be set with the help of the following parameters.

Function **with** or **without** control panel		Parameter
Thread trimming stop depending on angle (only mode 17)	dr°	**197**
Delay time	kd1	**280**
ON period	kt1	**281**
Delay time	kd2	**282**
ON period	kt2	**283**
Delay time	kd3	**284**
ON period	kt3	**285**
Delay time	kd4	**286**
ON period	kt4	**287**
Delay time until sewing foot On	kdF	**288**

8.13.5 Chainstitch for Pegasus (Mode 5)

Functions	Parameter
Selection of the chainstitch trimmer only in mode 5 **in general/Pegasus**	**196**

Parameter 196 = 0 Chainstitch trimmer in general (mode 5).
Parameter 196 = 1 Chainstitch trimmer Pegasus

If parameter 290 = 5 and 196 = 1, the chainstitch trimmer for Pegasus machines will be activated. When pressing the pedal to position –2 after stop in position 2, signal M3 will be activated for the time kt3 after the delay time kd3. Then the drive performs one rotation from position 2 to position 2 with signal M3 being activated. When position 2 is reached, signal M3 turns off, and signal M1 or M2 is activated after the delay time kd1 or kd2. After the time kt1 or kt2 has elapsed, the corresponding signal turns off, and the sewing foot can be lifted with time delay t7.
If the pedal is pressed to pos. –2 after stop in position 1, the drive runs first to position 2 and then the functional sequence described above will be performed.

See List of Parameters chapter "Timing Diagrams"!

8.13.6 Trimming Function at the Start of the Seam (Mode 5)

Functions		Parameter
Trimming function at the start of the seam (only in mode 5) On/Off		**273**
Delay time for signal M3 at the start of the seam	Ad1	**274**
ON period for signal M3 at the start of the seam	At1	**275**
Delay time for signal M2 at the start of the seam	Ad2	**276**
ON period for signal M2 at the start of the seam	At2	**277**
Delay time for signal M5 at the start of the seam	Ad3	**278**
ON period for signal M5 at the start of the seam	At3	**279**

Three different signals (M2, M3, M5) for various applications can be programmed at the start of the seam. They can be activated and deactivated by means of parameter 273. The delay times and ON periods can be selected by means of parameters 274...279.

8.14 Overlock Machine Functions (Mode 7)

8.14.1 Chain Suction Signal

The chain suction signal can be preselected for start and end counting, respectively, by means of the **S2** key on the control. If chain suction and tape cutter are switched off at the start of the seam, the respective counts will be suppressed. But they will be performed at the seam end.

Function		Control
Chain suction at the start of the seam On	LED 1 On	S2 key
Chain suction at the seam end On	LED 2 On	

Functions		Parameter
Sequence overlock mode (modes 7) with or without stop		**018**
Chain suction signal at the seam end until end of count c2 or until pedal in pos.0 (neutral)		**022**
Stitch counting speed at the start of the seam	n3	**112**
Stitch counting speed at the seam end	n4	**113**
Speed status during stitch counting at the start of the seam		**143**
Speed status during stitch counting at the seam end		**144**
Chain suction signal at output M1 (possible only in mode 7)		**148 = 1**
Enable chain suction signal at the seam end		**193**

There are various setting possibilities with the following parameters in the overlock mode (mode 7).

Parameter 018 = OFF Sequence with stop.
Parameter 018 = ON Sequence without automatic stop at the seam end. Parameter 022 must be set at ON.
Parameter 022 = OFF The chain suction signal at the seam end is disabled after count c2.
Parameter 022 = ON The chain suction signal at the seam end remains on until pedal in pos. 0 (neutral).
Parameter 193 = OFF Chain suction after the light barrier compensating stitches.
Parameter 193 = ON Chain suction from light barrier uncovered onwards.

It is possible to select the speed function during stitch counting at the start of the seam and at the seam end by means of the following parameters.

Parameter 143 = 0 Speed controllable by the pedal up to the set maximum speed (parameter 111).
Parameter 143 = 1 Fixed speed (parameter 112) without influence by the pedal. Stop with pedal in pos. 0 (neutral).
Parameter 143 = 2 Limited speed (parameter 112) controllable by the pedal up to the set limit.
Parameter 143 = 3 At fixed speed (parameter 112), can be suspended or interrupted depending on the setting of parameter 019.
Parameter 143 = 4 Limited speed (parameter 112) controllable by the pedal up to light barrier covered. Then fixed speed (parameter 112). Stop with pedal in pos. 0 (neutral).
Parameter 144 = 0 Speed controllable by the pedal up to the set maximum speed (parameter 111).
Parameter 144 = 1 Fixed speed (parameter 113) without influence by the pedal. Stop with pedal in pos. 0 (neutral).
Parameter 144 = 2 Limited speed (parameter 113) controllable by the pedal up to the set limit.
Parameter 144 = 3 At fixed speed (parameter 113), can be suspended or interrupted depending on the setting of parameter 019.
Parameter 144 = 4 At the seam end at light barrier speed without influence by the pedal. Stop with pedal in pos. 0 (neutral). Chain suction at fixed speed (parameter 113) without influence by the pedal is performed at the seam end with pedal in pos. –2 until stop.

8.14.2 Start and End Counts

Functions		Parameter
End count (c2) at limited speed n4 until stop	c2	**000**
Start count (c1) at limited speed n3 for chain suction	c1	**001**
Count (c3) tape cutter at the start of the seam	c3	**002**
End count (c4) for tape cutter at the seam end	c4	**003**
Seam end in mode 7 through end count (c2) or (c4)	MHE	**191**

The following settings are possible for determining the seam end by means of parameter 191:

Parameter 191 = 0 Seam end after count c4 (tape cutter)
Parameter 191 = 1 Seam end after count c2 (chain suction)

8.15 Function of Output Signal M3

Functions	Parameter
Functions of signal M3	**297**

The following settings are possible using parameter 297:

Parameter 297 = 0 Function according to setting of parameter 290
Parameter 297 = 1 Signal M3 is On whenever the light barrier is uncovered.
Parameter 297 = 2 Signal M3 is On whenever the light barrier is covered.
Parameter 297 = 3 Signal M3 is On only after light barrier uncovered or covered until seam end.
Parameter 297 = 4 Signal M3 is On as with setting 3. Signal ML (machine running), however, is Off while signal M3 is On.

If one of parameters 146, 147, 148 is set to “3“, parameter 297 is automatically set to “0“. If this setting is changed to “1...4“, parameters 146, 147, 148 are also automatically set to “0“. The function of the parameter that was last changed is performed.

8.16 Tape Cutter/Fast Scissors (Modes 6/7)

8.16.1 Functions for Mode 6

The signal **tape cutter/fast scissors** is issued only at the seam end. A manual tape cutter/fast scissors can also be set. See also chapter "**Manual Tape Cutter/Fast Scissors** ".

Functions	Parameter
Signal M1/M2 at the seam end On/Off **Tape cutter** at the seam end On/Off	**013** **014**

Functions		Control
Signal M1/M2 at the seam end On **Tape cutter/Fast scissors** at the seam end On **Signal M1/M2** and **tape cutter/fast scissors** at the seam end On **Signal M1/M2** and **tape cutter/fast scissors** at the seam end Off	LED 3 On LED 4 On LED 3 and 4 On LED 3 and 4 Off	S3 key

Output and Times for Tape Cutter

Functions		Parameter
Delay time for output M3 (ST2/27) **tape cutter** AH ON period for output M3 (ST2/27) **tape cutter** AH	kd3 kt3	**284** **285**

- Parameter **232** must be set at "**OFF**".
- The delay time for the tape cutter is usually set at "0".

Output and Times for Fast Scissors

Functions		Parameter
Delay time for output M2 (ST2/28) **fast scissors** AH1 ON period for output M2 (ST2/28) **fast scissors** AH1 Delay time for output M3 (ST2/27) **fast scissors** AH2 ON period for output M3 (ST2/27) **fast scissors** AH2	kd2 kt2 kd3 kt3	**282** **283** **284** **285**

- Parameter **232** must be set at "**ON**".
- The delay times for "fast scissors" are usually set at "0".

8.16.2 Functions for Mode 7

The signal **tape cutter/fast scissors** can be set separately for start and end counting. See also chapter "**Manual Tape Cutter/Fast Scissors** ".

Functions	Parameter
Signal M1/M2 at the seam end On/Off	**013**
Tape cutter at the start and at the end of the seam On/Off	**014**

Functions		Control
Signal M1/M2 at the seam end On	LED 3 On	S3 key
Tape cutter/Fast scissors at the start or at the end of the seam On	LED 4 On	
Signal M1/M2 at the seam end On and **tape cutter/fast scissors** at the start and at the end of the seam On	LED 3 and 4 On	
Signal M1/M2 at the seam end On and **tape cutter/fast scissors** at the start and at the end of the seam Off	LED 3 and 4 Off	

The tape cutter signal can be influenced by parameter 020 in such a way that the signal remains on at the seam end and is off when you start sewing again after some run-out stitches, which can be set by means of parameter 021. This action serves as clamp.

Functions		Parameter
Clamp at the seam end (output ST2/27) On/Off (mode 7)	kLm	**020**
Run-out stitches (ckL) of the clamp at the start of the seam (mode 7)	ckL	**021**

Output and Times for Tape Cutter

Functions		Parameter
Delay time for output M3 (ST2/27) **tape cutter** AH	(kd3)	**284**
ON period for output M3 (ST2/27) **tape cutter** AH	(kt3)	**285**

- Parameter **232** must be set at "**OFF**".
- The delay time for the tape cutter is usually set at "0".

Output and Times for Fast Scissors

Functions		Parameter
Delay time for output M2 (ST2/28) **fast scissors** AH1	kd2	**282**
ON period for output M2 (ST2/28) **fast scissors** AH1	kt2	**283**
Delay time for output M3 (ST2/27) **fast scissors** AH2	kd3	**284**
ON period for output M3 (ST2/27) **fast scissors** AH2	kt3	**285**

- Parameter **232** must be set at "**ON**".
- The delay times for "fast scissors" are usually set at "0".

8.17 Manual Tape Cutter/Fast Scissors

Upon pressing an external key depending on the preselection of parameters 240/242/243, the **tape cutter** or **fast scissors** can be enabled anywhere in the seam or at standstill.
See chapter "**Connection Diagram**" in the List of Parameters!

8.18 Backlatch Machine Functions (Modes 8/9)

See timing diagrams in the List of Parameters for backlatch machine functions in the two modes. An additional function is provided especially for mode 9 (parameter 290 = 9).

Whether or not a light barrier is connected or any changes have occurred at the light barrier input is automatically sensed after power on or having switched on mode 9. By briefly pressing the key during sewing, input in3 is prepared for enabling the automatic speed (n-auto) after light barrier sensing and for making the machine stop by means of the safety switch. When the machine is restarted, it will run at pedal controlled speed. The light barrier will be reactivated only by briefly pressing the key at output in3.

8.19 Seam with Stitch Counting

Functions	Parameter
Stitch counting On/Off	**015**

8.19.1 Stitches for Stitch Counting

Functions		Parameter
Number of stitches for a seam with stitch counting	Stc	**007**

The stitch counting stitches can be varied directly on the control by means of the above parameter.

8.19.2 Stitch Counting Speed

Functions		Parameter
Stitch counting speed Speed mode for a seam with stitch counting Speed n12 inverted/not inverted	n12	**118** **141** **266**

Speed control for stitch counting can be selected by means of parameter 141.

Parameter 141 = 0 Execution at pedal controlled speed
Parameter 141 = 1 Execution at fixed speed n12, when pressing the pedal forward (position >1)
Parameter 141 = 2 Execution at limited speed n12, when pressing the pedal forward (position >1)
Parameter 141 = 3 Automatic execution at fixed speed after having pressed the pedal once. The procedure can be interrupted by “heelback (-2)".
Parameter 266 = 0 Speed n12 is enabled when key is closed.
Parameter 266 = 1 Speed n12 is enabled when key is open.

The sewing speed is reduced in each stitch depending on the actual speed (max. 11 stitches before the end of stitch counting), in order to be able to stop exactly at the end of counting. When the light barrier is on, free sewing will be performed after stitch counting.

8.19.3 Seam with Stitch Counting When Light Barrier Is On

Functions	Parameter
Light barrier On/Off Stitch counting On/Off	**009** **015**

If the "stitch counting with light barrier” function is set, the number of stitches will be executed before the the light barrier is activated.

8.20 Free Seam and Seam with Light Barrier

Functions		Parameter
Positioning speed	n1	**110**
Upper limit of maximum speed	n2	**111**
Limited speed according to setting of parameter 142	n12	**118**
Lower limit of maximum speed		**121**
Speed mode free seam		**142**

Speed control for the free seam and the seam with light barrier can be selected by means of the speed mode.

Parameter 142 = 0 Execution at pedal controlled speed

Parameter 142 = 1 Execution at fixed speed n12, when pressing the pedal forward (position >1)

Parameter 142 = 2 Execution at limited speed n12, when pressing the pedal forward (position >1)

Parameter 141 = 3 Only for the seam with light barrier:
- Automatic execution at fixed speed after having pressed the pedal once.
- The seam end is initiated by light barrier.
- The procedure can be interrupted by heelback (-2).
- If the light barrier is not on, speed as with parameter setting 142 = 0.

8.21 Light Barrier

Functions	Parameter
Light barrier On/Off	009

The light barrier function at the input of socket B18/5 is active only if parameter 239 = 0.

8.21.1 Speed after Light Barrier Sensing

Functions		Parameter
Speed after light barrier sensing	n5	**114**

8.21.2 General Light Barrier Functions

Functions	Parameter
Light barrier compensating stitches	**004**
Number of light barrier seams	**006**
Light barrier sensing uncovered/covered	**131**
Start of sewing blocked/unblocked with light barrier uncovered	**132**
Light barrier seam end with thread trimming On/Off	**133**
Speed of the light barrier compensating stitches	**192**

- After sensing the seam end, the compensating stitches are counted at light barrier speed.
- Parameter 192 = OFF (speed n5 after light barrier sensing)
  Parameter 192 = ON (speed pedal controlled)
- Suspension of the procedure with pedal in pos. 0 (neutral). Interruption of the procedure with pedal in pos. -2.
- The thread trimming operation can be disabled by means of parameter 133, regardless of the **S5** key setting on the control. Stop in the basic position.
- Programming of max. 15 light barrier seams depending on the setting of parameter 006 with stop in the basic position. Thread trimming after the last light barrier seam.
- Light barrier sensing uncovered or covered at the seam end can be selected by means of parameter 131.
- Start blockage with light barrier uncovered programmable by means of parameter 132.
- The light barrier compensating stitches can be programmed and varied directly on the control by means of the above parameter.

8.21.3 Reflection Light Barrier LSM001A

Sensitivity setting:
Set minimum sensitivity depending on the distance between light barrier and reflection area (turn potentiometer as far as possible to the left).

- Potentiometer directly on the light barrier module

Mechanical orientation:
Orientation is facilitated by a visible light spot on the reflection area.

8.21.4 Light Barrier Monitoring

Functions	Parameter
Stitches for light barrier monitoring	**195**

In order to check the optical and electrical function it is possible to select a number of stitches by means of parameter 195. While these stitches are performed, the light barrier must be activated at least once. When the count is completed and the light barrier has not been activated, the drive stops and the message A6 appears.

- Select a number of stitches that is larger than necessary for the seam.
- The function is off if the number of stitches is "0".

8.21.5 Automatic Start Controlled by Light Barrier

Functions	Parameter
Delay of automatic start Automatic start On/Off Light barrier sensing uncovered Start of sewing blocked with light barrier uncovered	**128** **129** **131** **132**

This function enables an automatic start of the sewing operation as soon as the light barrier senses the insertion of fabric.

Prerequisites for the operation:

- Parameter 009 = ON (light barrier On).
- Parameter 129 = ON (automatic start On).
- Parameter 131 = ON (light barrier sensing uncovered).
- Parameter 132 = ON (no start of sewing with light barrier uncovered).
- The pedal must be kept pressed forward at the seam end.

For safety reasons this function is enabled only after a normal start of sewing. The light barrier must be covered as long as the pedal is in position 0 (neutral). Then press the pedal forward. This function is disabled when the pedal is no longer pressed forward after the seam end.

8.21.6 Light Barrier Filter for Knitted Fabrics

Functions	Parameter
Number of stitches of the light barrier filter Light barrier filter On/Off Light barrier sensing uncovered or covered	**005** **130** **131**

The filter prevents premature enabling of the light barrier function when sewing knitted fabrics.

- Enabling/Disabling of the filter by means of parameter 130
- The filter is not active if parameter 005 = 0
- Adaptation to the mesh is possible by varying the number of filter stitches.
- Knitted fabric sensing with light barrier uncovered ➔ covered, if parameter 131 = OFF
  Knitted fabric sensing with light barrier covered ➔ uncovered, of parameter 131 = ON

8.21.7 Functional Variations of the Light Barrier Input

Functions	Parameter
Selection of the input function on socket B18/5	**239**

If the light barrier function is not used, a switching function can be assigned to the input on socket B18/5 as well as to inputs in1, in3 and in4.

The following input functions are possible with parameter 239:
Parameter 239 = 0 **Light barrier function:** The input is prepared for a light barrier function.
Parameter 239 = 1...44 **All other input functions are identical with those described for parameter 240 below.**

8.22 Switching Functions of Inputs in1, in3 and in4

Functions		Parameter
Software debouncing of all inputs On/Off		**238**
Selection of the input function	in1/in3/in4	**240/242/243**

A variety of functions can be selected for each input on sockets ST2 and B4.

The following input functions are possible with parameters 240, 242 and 243:

240 = 0 **Input function blocked**
240 = 1 **Needle up/down:** Upon pressing the key, the drive runs from position 1 to position 2 or from position 2 to position 1. If the drive is not in the stop position, it runs to the preselected basic position.
240 = 2 **Needle up:** Upon pressing the key, the drive runs from position 1 to position 2. If the drive is not in position 1, it cannot be started.
240 = 3 **Single stitch (basting stitch):** Upon pressing the key, the drive performs one rotation from position 1 to position 1. If the drive is in position 2, it runs to position 1 upon pressing the key and from position 1 to position 1 each time the key is pressed again.
240 = 4 **Full stitch:** Upon pressing the key, the drive performs a full rotation depending on the set stop position. If the drive is not in a position, it runs to the basic position.
240 = 5 **Needle to position 2:** If the drive is not in position 2, it runs to position 2 upon pressing the key.
240 = 6 **Machine run blockage effective with open contact:** Upon opening the switch, the drive stops in the preselected basic position.
240 = 7 **Machine run blockage effective with closed contact:** Upon closing the switch, the drive stops in the preselected basic position.
240 = 8 **Machine run blockage effective with open contact (unpositioned):** Upon opening the switch, the drive stops immediately unpositioned.
240 = 9 **Machine run blockage effective with closed contact (unpositioned):** Upon closing the switch, the drive stops immediately unpositioned.
240 = 10 **Run at automatic speed (n12):** Upon pressing the key, the drive runs at automatic speed. The pedal is not used. (This input function is inverted in mode 9.)
240 = 11 **Run at limited speed (n12):** Upon pressing the key, the drive runs at limited speed (function of the key according to setting of parameter 266). The pedal must be pressed forward.
240 = 12 **Sewing foot lifting with pedal in position 0 (neutral)**
240 = 13 **High lift for walking foot operational mode not stored:** The signal “high lift for walking foot” is issued as long as the key is pressed down, and the drive runs with speed limitation (n10). Parameter 137 must be set to ON.
240 = 14 **High lift for walking foot operational mode stored /flip-flop 1:** The signal “high lift for walking foot” is issued upon briefly pressing the key, and the drive runs with speed limitation (n10). The operation is disabled upon pressing the key again.
240 = 15 **Tape cutter or fast scissors (mode 6/7):** Upon pressing the key, the tape cutter will be enabled for a preset time.
240 = 16 **Intermediate backtack / Intermediate stitch condensing:** Upon pressing the key, the backtack or stitch condensing will be enabled anywhere in the seam and at standstill of the drive.
240 = 17 **No function**
240 = 18 **Unlocking the chain:** Upon pressing the key, the motor performs a reverse rotation at the seam end. Moreover, backtacking and thread trimmer will be suppressed.

240 = 19 **Reset bobbin thread monitor:** After inserting a full bobbin, the stitch counter is set to the value determined by means of parameter 031.
240 = 20 **Positioning speed n1:** The function is independent of the pedal position.
240 = 21 **Reversal of motor rotation:** Change of the direction of motor rotation upon pressing the appropriate key in mode 12.
240 = 22 **No function**
240 = 23 **Speed limitation n9:** Enabled as long as the appropriate key remains pressed down in the seam.
240 = 24 **Drive runs from position 1 to position 2 (flip-flop 3):** Upon pressing the key, the sewing foot is immediately lifted, and the drive runs from position 1 to position 2. Machine run blockage is also enabled, but will be disabled by pressing the key again. If the needle is not in position 1, the start is blocked for safety reasons, and the sewing foot is immediately lifted.
240 = 25 **Speed limitation with external potentiometer:** Upon pressing the key, the external speed limitation becomes effective. Parameter 126 must be set at "2".
240 = 26 **No function**
240 = 27 **Unlocking the chain:** Upon pressing the key, the function "unlock the chain" will be performed without using the pedal.
240 = 28 **External light barrier:** In this mode it is possible to initiate the seam end by means of a key, not by means of the light barrier. But the light barrier function must be On.
240 = 29 **No function**
240 = 30 **No function**
240 = 31 **Function "speed limitation bit0":** Upon pressing the bit0 key, speed n11 will be enabled. Upon simultaneously pressing the bit0 and bit1 keys, speed n9 will be enabled.
240 = 32 **Function "speed limitation bit1":** Upon pressing the bit1 key, speed n10 will be enabled. Upon simultaneously pressing the bit0 and bit1 keys, speed n9 will be enabled.
240 = 33 **Speed n9:** Below this speed operation can be pedal controlled.
240 = 34 **Automatic speed n9:** The speed can be suspended by pressing the pedal to position 0.
240 = 35 **Automatic speed n9:** The speed can be interrupted by pressing the pedal to position -2.
240 = 36 **Automatic speed n9:** No influence by the pedal.
240 = 37 **No function**
240 = 38 **No function**
240 = 39 **No function**
240 = 40 **No function**
240 = 41 **No function**
240 = 42 **No function**
240 = 43 **Needle up with subsequent sewing foot lifting with pedal in pos. 0 (neutral)**
240 = 44 **Seam end as with pedal in pos. -2**

Input functions of parameters 242 and 243 are identical with those described for parameter 240.

8.23 Speed Limitation by means of External Potentiometer

Functions	Parameter
Speed limitation by means of external potentiometer (maximum value)	**124**
Speed limitation by means of external potentiometer (minimum value)	**125**
Function "speed limitation by means of external potentiometer"	**126**

A speed limitation can be set by means of external potentiometer using parameters 124 and 125. The external potentiometer can be connected to sockets ST2/2, ST2/3 and ST2/4.
Parameter 124: Maximum value for speed limitation with external potentiometer
Parameter 125: Minimum value for speed limitation with external potentiometer

The following functions for speed limitation are possible by means of external potentiometer using parameter 126:
Parameter 126 = 0 Function "external potentiometer" Off.
Parameter 126 = 1 The external potentiometer is active whenever the pedal is pressed forward. The drive always runs with the set speed limitation.
Parameter 126 = 2 The external potentiometer is active only if an input is set at "25" by means of one of parameters 240, 242 and 243. If the selected input is enabled and the pedal pressed forward, the drive runs at limited speed. The speed limitation can be enabled and disabled anywhere in the seam by means of the key.

8.24 “Machine Running“ Signal

Functions		Parameter
"Machine running" mode Switch-off delay for "machine running" signal	t05	**155** **156**

Parameter 155 = 0 **Machine running** signal Off.
Parameter 155 = 1 **Machine running** signal will be issued whenever the drive is running.
Parameter 155 = 2 **Machine running** signal will be issued whenever the speed is higher than 3000 RPM.
Parameter 155 = 3 **Machine running** signal will be issued whenever the pedal is not in position 0 (neutral).

The signal switch-off time can be delayed by means of parameter 156.

8.25 Function “Error Message A1” On/Off

Functions	Parameter
Error message A1 On/Off	**233**

Error message A1 can be disabled by means of parameter 233 if the pedal is not in position 0 (neutral) when switching the machine on.

Parameter 233 = OFF Error message A1 is suppressed. Then normal function (e. g. with automats).
Parameter 233 = ON Error message A1 is displayed. No function is possible.

8.26 Signal Output Position 1

- Transistor output with open collector
- Signal whenever the needle is in the slot between position 1 and 1A
- Independent of sewing, thus also when turning the handwheel manually
- Suitable e. g. for the connection of a counter
- An inverted signal is issued at socket ST2/20

8.27 Signal Output Position 2

- Transistor output with open collector
- Signal whenever the needle is in the slot between position 2 and 2A
- Independent of sewing, thus also when turning the handwheel manually
- Suitable e. g. for the connection of a counter
- An inverted signal is issued at socket ST2/21

8.28 Signal Output 120 Impulses per Rotation

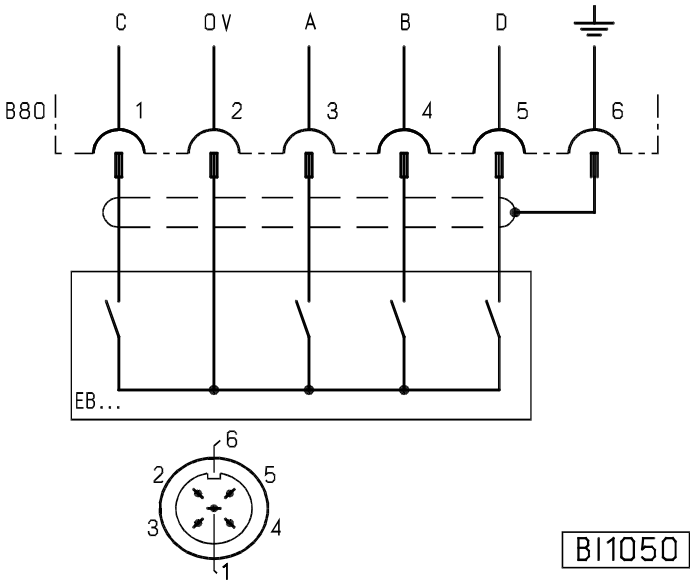
- Transistor output with open collector
- Signal whenever a generator slot of the position transmitter is sensed
- 120 impulses per rotation of the handwheel
- Independent of sewing, thus also when turning the handwheel manually
- Suitable e. g. for the connection of a counter
- An inverted signal is issued at socket ST2/22

8.29 Actuator

The commands for the sewing operation are input by means of the actuator, which is connected to the pedal. Instead of the built-on actuator another actuator can also be connected to socket B80.

Table: Coding of the Pedal Steps

Pedal step	D	C	B	A		
-2	H	H	L	L	Full heelback	(e. g. initiating the seam end)
-1	H	H	H	L	Slight heelback	(e. g. sewing foot lifting)
0	H	H	H	H	Pedal in pos. 0 (neutral)	
½	H	H	L	H	Pedal slightly forward	(e. g. sewing foot lowering)
1	H	L	L	H	Speed stage 1	(n1)
2	H	L	L	L	Speed stage 2	
3	H	L	H	L	Speed stage 3	
4	H	L	H	H	Speed stage 4	
5	L	L	H	H	Speed stage 5	
6	L	L	H	L	Speed stage 6	
7	L	L	L	L	Speed stage 7	
8	L	L	L	H	Speed stage 8	
9	L	H	L	H	Speed stage 9	
10	L	H	L	L	Speed stage 10	
11	L	H	H	L	Speed stage 11	
12	L	H	H	H	Speed stage 12	(n2) Pedal fully forward



EB.. Actuator

Functions	Parameter
Speed stage graduation	**119**

The pedal characteristics (speed change from stage to stage) can be varied.

Possible characteristic curves:
- linear
- progressive
- highly progressive

Functions	Parameter
Selectable pedal functions	**019**

Parameter 019 = 0 Pedal in pos. -1 blocked in the seam. But with pedal in pos. -2 sewing foot lifting is possible in the seam. (This function is possible only if the light barrier is On).

Parameter 019 = 1 With pedal in pos. -1 sewing foot lifting is blocked in the seam.

Parameter 019 = 2 With pedal in pos. -2 thread trimming is blocked.
(This function is possible only if the light barrier is On).

Parameter 019 = 3 With pedal in pos. -1 and -2 all functions are enabled.

Parameter 019 = 4 Pedal in pos. -1 and -2 is blocked in the seam. (Function only if parameter 009 = 1).

8.30 Master Reset

Recovery of factory settings.

- Press the "**P**" key and turn power on
- Input code number "**190**"
- Press the "**E**" key
- Parameter 100 appears on the display
- Press the "**E**" key
- The parameter value is shown on the display
- Set to "**170**" by means of the **"+"** key
- Press the "**P**" key twice
- Turn power off
- Turn power on. All parameters have been reset to their factory settings.

9 Signal Test

Functions	Parameter
Input and output test	**173**

Function test of external inputs and transistor power outputs with connected actuators (e.g. solenoids and solenoid valves).

9.1 Signal Test Using the Incorporated Control Panel

Output test:

- Select parameter 173
- Select the desired output by means of the +/- keys
- Enable the selected output by means of the >> key on the incorporated control panel

Display	Assignment of the outputs	
ON/OFF	Input test	
01	Free	on socket ST2/34
02	Sewing foot lift	on socket ST2/35
03	Output M1	on socket ST2/37
04	Output M3	on socket ST2/27
05	Output M2	on socket ST2/28
06	Free	on socket ST2/36
07	Output ML or M5	on socket ST2/32

Input test:

- Press the **–** key several times until "OFF" or "ON" appears on the control display.
- Actuation of external switches is displayed by the switching state ON/OFF.
- Several switches must not be closed at the same time.

10 Error Displays

General Information	
On the control	**Signification**
A1	Pedal not in neutral position, when turning the machine on (according to setting of parameter 233)
A2	Machine run blockage
A6	Light barrier monitoring
A7	Bobbin thread monitor

Programming Functions and Values (Parameters)	
On the control	**Signification**
Returns to 1st digit	Wrong code number or parameter number

Serious Condition	
On the control	**Signification**
E1	After power On, position transmitter or commutation transmitter defective, or connecting cables have been changed by mistake. During operation or after a sewing cycle, only position transmitter defects can be identified.
E2	Line voltage too low, or time between power off and power on too short.
E3	Machine blocked or does not reach the desired speed.
E4	Control disturbed by deficient grounding or loose contact.

Hardware Disturbance	
On the control	**Signification**
H1	Commutation transmitter cord or frequency converter disturbed.
H2	Processor disturbed

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